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ABSTRACT

This symposium brought together specialists in the fields of education, linguistics, and psychology to discuss the relationships between language and reading. Separate papers discuss reading and language development, the reading process, the role of prediction in reading, the contribution of pragmatics to reading, and the development of reading skills within a bilingual education program. (AA)

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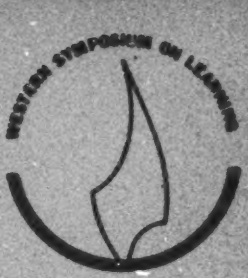

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SIXTH WESTERN SYMPOSIUM ON LEARNING: LANGUAGE AND READING

Editors

Sandra S. Smiley
John C. Towner

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PREFACE

The Sixth Western Symposium on Learning brought together specialists in the fields of education, linguistics and psychology to discuss the relationships between language and reading. Philip S. Dale of the University of Washington began the Symposium with an overview of language and reading. It was argued that the comprehension of both spoken and written language depend on fairly complex internal processes which develop over a number of years and that are influenced little by external reinforcement. The implication from a theory of internal reinforcement was that children should be given material to hear and to read that is just beyond their own level. Additional points were that reading draws on language development and that language development itself also draws on reading.

Kenneth S. Goodman of Wayne State University suggested that a significant reason for lack of progress in developing effective instructional techniques in reading is the absense of a clear view of the reading process. In his paper, Goodman presents a revised model which, although not yet finished, does present a usable conception of the reading process. For Goodman, reading is primarily a task of constructing meaning. As the reader constructs meaning, Goodman suggests that he moves sequentially through four cycles--optical, perceptual, syntactic, and meaning.

Frank Smith of the Ontario Institute for Studies in Education discussed the importance of prediction in reading and in learning to read. He defines prediction as "the prior elimination of unlikely alternatives" and argues that prediction in reading is necessary because: (1) words have multiple meanings; (2) spelling does not indicate pronunciation; (3) there is a limit on the amount of visual information that the brain can process; and (4) short-term memory has a limited capacity. It was suggested that prediction enables the reader to overcome these difficulties. Smith explains that prediction is characteristic of fluent reading and is essential in learning to read. Conditions necessary for prediction to occur as a result of classroom instruction are presented and discussed. These include using meaningful material and allowing the freedom to make mistakes.

Roger Shuy of Georgetown University and the Center for Applied Linguistics presents a discussion of linguistics as related to reading and learning to read. He argues that incomplete concepts of linguistics have limited the contribution of linguistics to reading. He suggests that other aspects of linguistics --the most notable of which is pragmatics--offer insights into the reading process. Pragmatics is that aspect of linguistics "...generally concerned with the broader role of context as it is related to the beliefs and attitudes of the

participants in a communication event." Shuy suggests that pragmatics or "pragmatic context" is most crucial in more advanced stages of reading. In beginning reading, pragmatic context is available to the reader but plays a relatively less crucial role. A knowledge of pragmatics--a knowledge about language and its use in the real world--may be necessary for fluent reading. He explores ways in which pragmatics can be of help to a reader and offers some suggestions for the teaching of reading.

Whenever educators consider the adoption of some form of bilingual education, they must decide in what order they will sequence the introduction of instruction in the mother tongue and in the second language; and furthermore in what order they will sequence the introduction of reading in the two languages to obtain optimal results in their particular sociolinguistic setting. In his paper, G. Richard Tucker of McGill University briefly describes four very different types of bilingual education programs and then reports the results of a recently completed analysis of the development, over eight years, of reading skills in English and in French within the context of a bilingual program for English-speaking youngsters in Montreal.

The Symposium was held on October 31 and November 1, 1974 and was attended by people from Canada, the United States and the Mariana Islands. The editors are grateful to a number of people who helped make the Symposium possible. Professor Paul Woodring presided over the Symposium and introduced the speakers for each of the presentations appearing in this book. Dean Arnold Gallegos introduced Kenneth S. Goodman and Frank Smith to an audience of public school personnel for a special session on November 2. H. O. Beldin and George Lamb of the Education Department and Frances Aboud, Pete Elich, Fred Grote, Marcia Lippman and Pete Pielstick of the Psychology Department very kindly contributed time from their other duties to assist with important details. Helen Bruns and Carolyn Muller took charge of correspondence, bookkeeping and other frustrating business matters essential to the Symposium's development.

Sandra S. Smiley
John C. Towner

Bellingham, Washington
May, 1975

READING AND LANGUAGE DEVELOPMENT: SOME COMPARISONS AND A PERSPECTIVE

Philip S. Dale

Surely reading, and the learning and teaching of reading, are the most intensively studied processes in all of education. Nevertheless, there are, I think, just two overwhelmingly important facts about learning to read. First, many children--perhaps most--do learn to read, and their success seems to be rather independent of the particular "method" used. Of course, for many of these the statement is true because they come to school already knowing quite a bit about reading. But many more will make it on the basis of their school experience. The second fact is that many children--it is impossible to be precise about numbers, but, say a fourth--will have difficulty in learning to read, and their problems or even failure seems to be rather independent of the particular method used.

It seems to me that one can roughly categorize people interested in reading in terms of whether they find the first or the second fact more impressive. Sometimes, when reading an article about reading which emphasizes the success and fluency of many readers, one can forget the problems and failures; and vice versa. But both facts are there--equally important, equally surprising, and equally stubborn.

This morning I would like to consider the relationship between language development and learning to read. I suppose one's attitude toward the relevance of language development for understanding reading follows from one's choice from the two facts. Language acquisition is the success story of development; it is perhaps the most impressive achievement of human development, yet in nearly all cases it is virtually effortless. So it must seem more relevant for those impressed by the successes in reading than to those impressed by the problems. But I think it is relevant for both.

My comments are organized around three topics: first, a general comparison of language development and learning to read; second, a consideration of the way learning to read draws on the fruits of language development, that is, the language competence which the six-year-old brings to the reading classroom; and third, some consideration of the way learning to read may in turn affect language development.

To begin the comparison, consider the question why? Why does the child learn to talk? Why does the child learn to read? In the case of language, we can rule out certain hypothesized motivating forces. Although it is true that parents are delighted with their child's early language production and reinforce

talking per se (at least for a while) it is not the case that they motivate changes in the direction of more mature language by reinforcement (Brown, Cazden, & Bellugi, 1969). There is simply no evidence that more advanced sentences are in any way more reinforcing than less advanced ones. This is true whether reinforcement is construed as approval, attention, or satisfaction of the child's demands. For example, my son Jonathan, at 26 months, asked for a repetition of some favored activity such as lifting up, by saying 'gain, with a rising intonation. Five months later, he said do that again, Dad. The latter sentence is linguistically far more sophisticated than the former, but it was not more effective than the former. Young children are amazingly capable at expressing themselves with a simple linguistic system.

If not reinforcement, why? We really don't know, but I think there are two primary motivations for the young child. The first is modelling: the significant people in the child's environment, parents and, perhaps even more important as models, older siblings are using language. The child wants to participate. Or, to quote my son again at about the same age, interrupting a breakfast table conversation between my wife and I, don't talk over me! To say that modelling, or imitation, is a motivating force is not to say that imitation is a major mechanism of the actual learning how; in fact, we have rather good evidence that imitation is not helpful in learning how (Ervin, 1964; Bloom, Hood, & Lightbown, 1974).

The second motivator is the intrinsic pleasure of communicating, of expressing one's ideas and understanding others. Much of the young child's early language is not directed toward obtaining some external goal; rather, it is a running description of the child's activity or someone else's. It is being verbally encoded simply because the child wants to convert it from action to language. To say that children learn language in a social setting, by communicating, is a cliche, but it is one of the implications which have been little explored. Let me give just a few examples of the ways in which children are highly sensitive to the communicative demands of the situation. Preschool children modify their speech as a function of whom they are talking to. Younger children are not addressed in the same way as peers, and peers are not addressed the same way as adults. The differences include grammatical, pragmatic and informational aspects (Shatz & Gelman, 1973; Ervin-Tripp, 1974; Shorr & Dale, unpublished). Another example: language communicates more than simple messages about the world; it communicates something of the expectations and presuppositions of the speaker. If I ask did you see the white car? in contrast to did you see a white car? you are likely to believe that I, as speaker, know that there was a white car, and in fact, you are more likely to answer yes. The same is true of four-year-old children (Dale, Loftus & Rathbun, unpublished). The point is not that four-year-olds are suggestible--we know that--but that four-year-olds are responsive to this special communicative function of the definite article. Finally, even two-year-olds, just beginning to put two and three word sentences together, show a sensitivity to the distinction between new and old information within a conversation. Wieman (1974) has found a striking systematicity in the placement of primary stress within two-word sentences, a systematicity correlated with the distinction between new and old information. For example, sentences

consisting of a noun and a location word, such as rabbit down and kids school-bus, are virtually always stressed on the location word. Generally, the new information in sentences of this type lies in the location. But when the noun is the new item, it, and not the location word, is stressed, e.g., mother asks what's in the street? and the child replies fire-truck street. These three examples all illustrate a sensitivity to communicative nuances even at early stages of language development.

So the evidence for language development is negative on external reinforcement, more positive for modelling and communication. What about reading? External reinforcement of various types, ranging from teacher approval through gold stars to grades, is widely used. And undoubtedly necessary in many cases. Nevertheless, the use of external reinforcement is a very tricky thing, as many applied behavioral scientists have been finding out recently. A case in point is the recent study of Greene, Lepper and Nisbett (1973) who found that they could literally spoil preschool children's pleasure in drawing with magic markers on paper by having a session in which they were working for "Good Player Awards," a colored three-by-five card with a large gold star, a red ribbon, and the phrase "Good Player Award" on it. The children who drew for six minutes for such an award showed much less interest in the activity a week later than children who had simply drawn for six minutes to show their pictures to a visitor. In their phrase "Work consists of what a body is obliged to do and ....play consists of whatever a body is not obliged to do" (Greene & Lepper, 1974). Or, to paraphrase, if I am being rewarded for doing something, it must be because I wouldn't want to do it anyway. Similar findings came from a study of a token economy system for teaching mathematics in the fifth grade. Clearly these findings do not imply that extrinsic reinforcement should never be used--basic skills often must be developed before the intrinsic motivation can take over. But they should be held to a minimum, and removed as soon as possible. And, in fact, everything possible should be done to make possible the intrinsic satisfaction.

Which brings us to the more positive motivators in language development: modelling and communication. I doubt that modelling is very important for reading. Children do see adults engaged in reading and writing, but most of the process is internal and simply not observable. The concept of communication is more relevant. I have often wondered what first graders think is the reason for learning to read, or whether it is simply one of those inexplicable things about the school setting. Language and reading are two-way communication devices; part of their power comes from the experience each of us has had in the dual roles of sender and receiver. But the child is usually given only the task of reading at first. In a sense, the phrase "learning to read" is unfortunate, just as is "learning to talk." Understanding spoken sentences is an important as generating them; both activities require the same knowledge of the linguistic system, to generate new sentences, and to understand new sentences. In fact, in many cases the child can understand more than he can produce. Similarly, reading is incomplete without writing. As Carol Chomsky has written, "The natural order is writing first, then reading what you have written" (Chomsky, 1972a). To be sure, there are problems of motor coordination and fine

perceptual discriminations, and it may be a good idea to provide preprinted letters for this purpose, or even have the teacher write for the child, in a dictation framework. But the essence of writing--combining letters to express meaning--could receive much more emphasis. I will return to this point later. But for now, it should be made clear that communication does not just mean communication to the teacher; it may be communication to other children, or perhaps most powerful of all as a motivator, communication to the self, the foundation of esthetic pleasure.

Let us turn now to another point of comparison between language development and learning to read. Somewhat independently, researchers on language development, and on readings, have come to rather similar conclusions: the processes are more complicated than we thought. Though the linguistic achievement of the four-year-old is as impressive as ever, there is much more to come. Similarly, the difference between the beginning reader and the fluent reader is greater than we might have supposed.

In the years from four to ten, children must learn more about all levels of their language, grammatical, semantic, and pragmatic. Many structures which at first seem straightforward pose special difficulties. For example, children below six or seven are likely to misinterpret the question is the doll easy to see?, taking the doll as the subject of see, though in fact it is the object (is it easy for you to see the doll?), because of the general tendency in English for subjects of verbs to precede them (Chomsky, 1969). Knowledge of the meaning of words increases slowly, especially words like left, right, more and less, and also knowledge of relationships among word meanings, e.g., that words have opposites and that some words are inclusive of others--flower includes tulip, big is more general than tall, etc. Genuine metalinguistic awareness is late in appearing. For example, the work of de Villiers and de Villiers (1974) has shown that although children show the ability to use word order in determining subject and object in subject-verb-object sentences, both in production and comprehension, at an early stage, the ability to make a correct/not correct judgment about a sentence, and to correct wrong sentences, comes much later. Similarly, semantic integration skills, the ability to integrate the information from several sentences into a single representation and to "go beyond the information given," to draw inferences from this representation develops over many years. The pragmatic aspects of language use, to be discussed later in this Symposium by Roger Shuy, could provide many more examples.

Similarly, the beginning reader, even the successful beginning reader, has a long way to go. We tell beginning readers to look at every letter; we know that being a fluent reader means not looking at every letter or even every word. Beginning readers are asked to read aloud. Reading aloud slows fluent readers (though McGuigan's research is a caution here). In general, becoming a fluent reader means becoming less and less specifically tied to the concrete details on the page. Kolers' (1966) bilingual readers represent an apex of this process. Given a text which changes unpredictably from English to French and back again, they read it fluently, but without the ability to keep straight in what language any given portion is written.

My third comparison concerns the nature of the input to the learner.

Although adults simplify their speech to a certain extent when they speak with young children (Snow, 1972), the range and variety of constructions is still remarkable. It certainly exceeds that of the child's own productions. Furthermore, it concerns all of the significant activities of the child and more. In contrast, the input to the child learning to read is deliberately impoverished, both in form and content. Perhaps more time and money has gone into the construction of vocabulary lists, readability scales, and more recently construction counts, than any other single aspect of reading instruction. I think this has been overdone. We know that children generally are more interested in materials which are just a bit beyond their level, complex enough to be interesting, but not beyond the possibility of relating to what they already understand (incidently, this is just as true of adults as it is of children).

A final point of comparison. One clear implication of recent research both on language development and learning to read has been to change our attitude toward "errors." Often children acquiring language may appear to regress. For example, the first instances of the past tense produced by children are correct versions of the irregular past, e.g., did, came. Then these are abandoned for the regular ending, doed, comed, walked, etc. This is particularly striking since the correct versions were actually practiced, often for several months, before being changed. But doed and comed represent an advance, a discovery of of a pattern. Eventually the distinction between regular and irregular verbs will be straightened out, but this stage of over-regularization--a universal aspect of child language around the world--is a step ahead. Errors in reading also often represent progress, first attempts at using new strategies for decoding. I'm sure many teachers have had this insight, but of course it has been argued most persuasively in recent years by Kenneth Goodman, who I am sure will have more to say about this subject later in the Symposium. These so-called "errors" (Goodman has proposed the term "miscues") often show us most strikingly that learning, whether to talk or to read is an active process, not a passive one.

The second topic in my general outline concerns the ways in which learning to read draws on the fruits of language development, the competence of the six-year-old child. According to one traditional view, reading simply adds one stage to the language processor, a stage which converts the printed word to an auditory word, which is then processed like any speech input. The difficulties encountered by this simplistic theory are too well known to require discussion here. The dependence of reading on language development is more complex, because reading and language do have fundamental differences. Some of them are perceptual, stemming from the differences between an auditory and a visual input. The auditory system processes patterns in time; the visual system processes patterns in space. The visual system has the advantage of being able to go back and look again; it has the disadvantage that we see only what we are looking at and in fact have eyelids. That is, the visual input does not have the almost irresistible impact that auditory input, especially speech, has; a greater attentional effort is required. Other differences are lexical and grammatical; to an extent, written language uses different words and constructions than spoken language. So the relationship must be more indirect.

The six-year-old has a vocabulary of several thousand words. Beginning reading materials have far smaller vocabularies. There are a number of reasons for this, including an avoidance of words which do not fit a simple letter-sound correspondence, and also a desire to avoid words not in the children's vocabulary. However, this restriction is often carried to extremes. Not only are words not in the children's vocabulary not utilized, it is felt that only the most frequent items should be used. The assumption that this aids comprehension has little evidence supporting it. Furthermore, vocabulary counts are typically based on children's productions, though generally adults and children have larger receptive vocabularies than productive. The situation with respect to grammar is nearly identical. Much recent research--Strickland, Tatham, Ruddell and others--has shown that constructions which are absent or rare in children's speech are less perfectly comprehended than those which are common. This problem may be especially serious where vocabulary constraints due to a phonic emphasis necessitates use of rather bizarre sentences, e.g., Al and the big man began to dig in the big man's pit (Rasmussen & Goldberg, 1964, p. 62). But I wonder if we are not in danger of repeating the vocabulary mistake, of oversimplifying syntax as well as vocabulary. Recall my point earlier about the natural input to the language learner as being somewhat beyond his own level. This fact, together with the general superiority of comprehension over production, suggests that we should not be totally bound by children's productions. To be sure, constructions which are clearly not understood by children should be generally avoided. Carol Chomsky's work has identified a number of these. As an example which concerns both vocabulary and syntax, consider Mother scolded Sam for taking a cookie, and I would have done the same, with Mother scolded Sam for taking a cookie, although I would have done the same. The relation between although and the phrase done the same is not realized until fairly late in childhood. But this must be done in a way--and here I recall my first point, about extrinsic and intrinsic motivation--that preserves the interest of the book. It also suggests that perhaps a major means of evaluating materials should be the children; that if a book really holds the interest of the reader, if he or she wants to read it, it must be doing something right.

The child entering school has also mastered much of the complex phonological system of his language. This is probably the greatest untapped resource in teaching reading and writing. English has a spelling system which is a compromise between a direct letter-sound correspondence system and one which indicates directly the meaningful elements of the language. Many--perhaps most --of the apparent idiosyncracies of English spelling are in fact cases where meaning is being cued directly. For example, the past tense forms hugged, walked, and wedded have three distinct pronunciations /d/, /t/, and /əd/, yet the past tense is spelled ed consistently. The actual pronunciation is indicated by rules which take into account the final sound of the verb. And, as Berko (1958) has shown, preschoolers are in full command of these rules, and are able to produce the correct form for a novel verb, e.g., missed /mist/. Similarly, the first five letters of medical and medicine are identical, though in one case the c is pronounced /k/ and in the other /s/. This alternation between /k/ and /s/ is fairly common (compare with critic, critical) and quite

predictable on the basis of the suffix. The words principal and principle illustrate the converse process; words which sound alike, but have different meaning. The point is that English spelling tends to indicate the meaningful elements, the morphemes, rather directly, and the pronunciation indirectly, by rules which are in the competence for spoken language possessed by any fluent speaker.

As Carol Chomsky (1970) has pointed out, many of the apparently arbitrary spellings of English can be resolved by considering related words. Take, for example, the reduced vowel /ə/, which in the words president, history, and industry is spelled i, o, and u, respectively. Chomsky suggests pointing out the similarity in meaning to preside, historical, and industrial, where the letters gain their usual sound. In many cases, the necessary words are already in the children's vocabulary. (Of course we are talking about children a few years beyond the first grade.) If not, she suggests, why not teach a new word; the child's vocabulary would be enriched, and the spelling system of English would lose something of its mystery. For example, the silent g of sign and design is pronounced in signal and signature.

These examples are appropriate for, say, third and fourth grade readers. But what about the beginning reader? I have mentioned these relatively advanced examples first because it is important to keep in mind, when considering the question of spelling for beginning readers, that eventually the child will be reading standard English orthography; that is our goal. It is undoubtedly true that the complexity of the system presents an initial difficulty; the question is whether avoiding this initial difficulty will produce other problems later. Learning to read is not over at the end of the first grade.

The most common response to the failure of English spelling to be a simple indicator of sound has been to restrict the vocabulary used. This almost always requires a small vocabulary and rather artificial sentence. A more sweeping response has been to abandon the traditional system in favor of a more regular one. The initial teaching alphabet (i.t.a.) is the best known of these, though there have been others (Pitman & St. John, 1969). In the i.t.a., generally a given letter has just one sound. For purposes of identifying the sound of the word, such a system has much to recommend it. But what about identifying the meaning? If a given element of meaning is pronounced in different ways (recall medical, medicine), it must be spelled differently. If reading is proceeding from letter to sound to meaning, this might be efficient. But if reading is proceeding from letters to meaning, the change in spelling is positively distracting. Still, it remains a possibility that one major difference between beginning readers and later readers is this dimension of whether sound is a necessary intermediary--what Frank Smith has called mediated word identification, as opposed to immediate identification. Gillooly (1973) has carefully reviewed the evidence on the effects of different writing systems. He concluded that in the early stages, phonetic writing systems such as the i.t.a., or the traditional writing system for German, have an advantage, of a limited sort. Word recognition skills are indeed better, and also spelling. But not paragraph-meaning scores. However, by the fourth grade, children read traditional orthography better than simplified ones. There are probably two factors here.

One is that traditional orthography encourages grouping letters in meaning-relevant ways, rather than sound-relevant, and this leads to larger clusterings. The second factor extends beyond the single-word level. Part of learning to read well is learning not to look at everything on the printed page. Presumably in an orthography which is meaning-based, as in traditional English orthography, one can form expectancies as to where to look for maximum information.

The evidence for the claim that an orthography like the traditional one for English is read better in the fourth grade than a phonetically based one comes primarily from cross-national comparisons, such as that between American and German children, since German spelling is relatively more phonetic. Of course, English speaking children do not read i.t.a. in the fourth grade; a transition is made sometime during the first two years. The really crucial question is: does early use of i.t.a. help or hinder in the long run? To my knowledge, there is really no good evidence on the question, evidence that could compare children on reading comprehension at intermediate levels on the basis of their initial spelling system. A particularly interesting ability to examine would be the acquisition of new words. By this I do not mean reading words which are already in the reader's vocabulary, though never before encountered in print, but words which are genuinely new to the reader. As Brown (1958) and others have pointed out, the ability to decode letters to a sound sequence which has never before been heard is not very useful. A meaning-based system is more likely to be of help. In the long run, after all, reading is supposed to be a way to learn new things.

One solution to this spelling problem which has not been tested extensively but would appear to have much to recommend it, is simply to let children make up their own spelling systems. The idea of giving children a more active role in learning to read is not new--in Teacher, Sylvia Ashton Warner let children make up their own vocabulary, then she showed them how to spell the words--and in other approaches children have experience in dictation, thus, determining the syntax of the reading materials. Charles Read (1971) has studied the writing systems spontaneously invented by bright preschoolers, and Carol Chomsky (1972a) has suggested that children be encouraged to do this. In fact, the spellings invented by children are quite sensitive to many aspects of the sound system of English, even if they are quite different from an adult's. Consider the child who is trying to spell "wet." He begins with an R, which is reasonable, since he generally pronounces R identically with W. For the vowels, children seem to rely heavily on letter names. So in trying to write the sound "eh" he must choose from "eye," "iy," "ay," "ow," and "uyw." The natural selection is "ey" or A. T is the final letter selected, and the child finishes with RAT, which he reads as "wet." Other regularities crop up: there is more consistency than you might think. The learner is getting practice in thinking about how words sound, systematically representing sounds, and learning that writing is fun. Later will come the discovery of the myriad printed words about him--street signs, food labels, books, billboards, and more. Now he tries to read these and runs into certain problems, but he is ready to ask for help. He has the basic idea of reading. Although such a program has only been tried informally, it deserves further exploration.

Thus far we have assumed a uniformity of language and dialect; that the children bring a language with them which is used in the classroom and in reading. This is not always the case. It is worth pointing out that such dialect or language differences need not necessarily cause problems. There are many places around the world where children use one language or dialect at home, and and another in school. For example, Fishman's (1972) study of the Schwaben dialect of German, spoken around Stuttgart. In many cases, the children simply switch language or dialect when they come to school. In the Schwaben case, children speak one dialect to the teacher and she may reply in her own, more standard German. Whether language becomes a problem says more about the politics and social conflicts within the society than it does about linguistics. But unfortunately, dialect differences do cause problems in the United States. Despite lip service to pluralism, we have never been particularly fond of cultural diversity, e.g., the "melting pot" image.

Research in the last ten of fifteen years (Labov, 1970) has done much to dispel the myth of verbal inferiority of black children, and establish existence of Black English (BE) as alternative version of English. This research is often misunderstood. An example. A newspaper headline a few years ago read: "English, a foreign language to Negroes." This is wrong on at least four points. 1) Many blacks do not speak BE; 2) BE is English just as much as standard White English; they are alternative dialects; 3) BE and Standard English (STE) are not foreign languages; they are distinct dialects, with a great deal in common; and 4) many black children have considerable comprehension skills with respect to STE if not production skills.

Later Dick Tucker will be discussing a number of quite different bilingual education programs, each of them a possible model. I will just make a few comments on dialect differences and reading in our society. Surely an educational system should capitalize on the capacities children bring to school, rather than penalize them. How best to do this, however, is not obvious. What is obvious is that expecting children to learn to read, and to learn to produce orally a second dialect as is typically the case in the classroom, is mistaken and unfair. Furthermore, using a more sound-based orthography such as i.t.a. compounds the problem enormously for speakers of nonstandard dialects. This is true both because their pronunciation of lexical items will be different, and because the methodology emphasizes to the learners that the printed word directly translates into sounds. One defense of traditional English orthography is that it is equally "illogical" for all speakers of the language! In fact, there is good reason to believe that for the most part the basic meaningful elements, the morphemes are the same at an underlying level in various dialects, despite wide divergence in actual pronunciation. In principle, there is no reason that speakers of a different dialect could not read materials printed in standard orthography and pronounce them in their own dialect, using their knowledge of the phonological system of English and their dialect. In fact, this is what many black children do. Perhaps the degree to which these children change the text as they read would be a good measure of how much they are understanding the text. A more thorough-going strategy is, of course, to use materials prepared in dialect. As Dr. Tucker will demonstrate, there is good evidence that learning to

read in one language or dialect and then switching to another is far from harmful; in fact, positively helpful. I suspect this is true not only for pedagogical reasons--the child learns the basic idea of reading, and then can transfer it, but for social reasons--an acceptance by the school of the child's language or dialect is a basis for the child's later accepting the school's language or dialect.

The evidence is not yet in on the use of black dialect in teaching early reading. It is a harder program to put into practice than we might have thought. There are problems of difference of dialect within the classroom, and parental and other attitudes outside. This is not the first time that liberal beliefs about language and culture have conflicted with the goal of community control, of parents who, for varied and good reasons, have different goals for their children from those of educators. Nevertheless, it is a hopeful and exciting experience, and I look forward to seeing the outcomes.

It is probably a good idea to separate questions of word-spelling from grammatical structure in this issue. With the general, though not perfect, identity of underlying representation in various dialects of English, it seems justified to use the same orthography for all children. The translation from printed word to spoken word will draw on the basic phonological knowledge possessed by each child for his or her dialect. Grammar presents a different problem, and it may well be most efficient to use nonstandard syntax, though a transition program of the sort suggested by Stewart (1969) will then be necessary.

Part of the problem in considering questions of dialect in education comes from the belief that there are only two solutions to the problem; the first a forced assimilation of diverse languages and cultures into a single mode, e.g., making everyone use standard, white English; the second, encouraging each individual to use a single dialect, the native dialects, for all purposes. This belief underlies attacks such as Siedd's in "Bi-dialectalism: the linguistics of white supremacy" (Siedd, 1969). Siedd argues that the recent emphasis on Black English and the proposal of bi-dialectalism as a goal for Black children is still racist, in that it makes other groups into copies of MC whites, and that it is blacks, not whites, who are supposed to change. I think this belief underestimates both the complexity of language and the ability of children. Speaking, understanding, reading, and writing are distinct ways to use language, and it is certainly not necessary to have the same strategy for each. Reading a sound dialect is not the same as speaking one. Children are perfectly capable of using more than one dialect or language in different settings. Our goal must be a society in which people can communicate with each other. But this does not mean that everyone must speak the same way. We all need to be receptively bi-dialectal.

The third topic in my outline concerns the possible influences of reading on language development. The relationship between language and reading runs both ways. Carol Chomsky (1972b) has collected evidence which suggests that the amount of exposure to reading, both the child's own reading and reading to the child by adults, is highly correlated with linguistic development in the years five to ten, and that this correlation is not simply due to variables such as IQ, father's education, and so on. Although her evidence is not yet conclusive, it

does suggest that the child's language learning ability comes to school with him, so to speak, and that the materials encountered in school are an important input for further learning. The learning is accidental, in the sense that no direct attempt to teach the grammatical structures she tested has been made, or should be made. The point is that the children are able to take advantage of the richness and variety of language encountered. Note that if this conclusion is valid, it runs counter to the approach discussed earlier of simplifying structures to the level of the child. Learning can only take place if the child is exposed to new aspects of language.

A second way in which reading may affect language development is more direct. Much of the evidence for the claim that traditional English orthography reflects meaning directly, and hence is superior to a sound-based system, comes from complex derivational forms, such as critical/criticize. The richness of the vocabulary encountered in intermediate reading, if not beginning reading, may provide the essential input for the child to develop the dual-level phonological representations of words claimed by Chomsky and Halle and other linguists--a meaning-related level and a sound-related level. Furthermore, learning to read promotes an awareness of language, an analytic ability, which would be difficult to instill in any other way.

A third way in which language may be affected by learning to read is in communication. Although it is true that children learn language in communication settings, it is equally true that in many situations they are not very effective communicators. Underlying their difficulties is the pervasive problem of egocentrism, as Piaget has described it. Young children have great difficulty in seeing situations from any perspective other than their own. For example, a four-year-old can identify his own left and right hands, but when asked to identify the left and right hands of someone facing him, he will be exactly incorrect, pointing to the hand on his own left rather than on the other person's left. Similarly, when asked how someone on another side of a landscape display sees the display, he is likely to report that they see exactly the same view that he does. In a larger sense, this problem of egocentrism, of being able to get outside one's own perspective, and into the shoes of the listener or reader, remains with us throughout life; it is the fundamental problem of teaching. One of the most interesting sections in Vygotsky's book Thought and Language (1962) concerns the special nature of written language in this respect. Vygotsky compares "inner speech," talking for one's self, with talking to others. Inner speech can be highly abbreviated and rapid. It is something like talking to someone you know very well about a familiar topic; much can be left out. But talking to another person requires filling in much additional information. When we consider writing, we realize that it is just that much further removed from inner speech. The reader is not present, so we have no immediate feedback, either verbal or nonverbal. In fact, the writer may not even know who the reader will be. No assumptions can be made about the specific knowledge of the reader. In Vygotsky's words, "the change from maximally compact inner speech to maximally detailed written speech requires what might be called deliberate semantics--deliberate structuring of the web of meaning (Vygotsky, 1962, p. 100). The alternation between reading and writing is probably of

great value here. Both Piaget and Vygotsky would agree that a great aid to overcoming egocentrism is switching roles, actual experience at seeing things from different perspectives. Shantz and Wilson (1972), in fact, used this as a tool for fostering communication skills, without using writing. They had second graders participate in a communication task requiring one child to describe a picture to another so the second one could pick it out, or draw it himself. The children took turns being sender, receiver, or observer. The program produced significant gains in communicative ability. To me, this suggests that writing should not just be something the child does for his or her teacher, but rather that children should sometimes read what they and other children have written. Only in this way will the child eventually be able to conceive of the reader and his informational needs, as he writes.

A Concluding Perspective

Reading and oral language skills are not the same thing. Reading is not just a letter-to-sound process tacked on to oral language. The similarities and commonalities are at a much more abstract level. One implication of the St. Lambert experiment, to be discussed later in this symposium, is that reading really exists as a skill independent of oral language. In the Montreal program, children learn to read French, but with little or no direct instruction, they can read English.

On the other hand, consideration of language development is relevant for reading, both because it increases our respect for the learning abilities of the child, and because it gives us a better understanding of the knowledge which the beginning reader brings to the classroom. Skills and knowledge developed in learning language are important for learning to read. This is true not just for knowledge of the grammar or phonology of the language, but for psycholinguistic and cognitive skills as well. For example, Frank Smith will be discussing the role of prediction in reading, the fact that what is on the printed page is only one source of information about the meaning, the other source being the reader's ability to use his knowledge of language and the world to predict what is coming. Precisely the same thing could be said of listening and comprehending spoken language. Not everything is available in the acoustic signal. We can even communicate over a noisy telephone line, if we know the speaker's voice and the general topic.

A friend of mine recently began work at an urban community college, in their reading program. I asked her how it was going, and she said "I've acquired a new respect for illiterates." Many of the students were making it, albeit with <u>great</u> difficulties, without functional reading skills. I would like to close with a plea to consider reading less in isolation, and more as an important, but not the sole, communication and information-gathering tool, embedded in the ongoing process of living, to keep in mind always the question "Why?"

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THE READING PROCESS

Kenneth S. Goodman

In a very real sense this paper is a progress report. Some years ago I decided that a major reason for the lack of forward motion in attempts to develop more effective reading instruction was a common failure to examine and articulate a clear view of the reading process itself. Knowledge, I felt, was non-cumulative in improving reading instruction largely because we either ignored the reading process and focussed on the manipulation of teacher and/or pupil behaviors or because we treated reading as an unknowable mystery.

Ironically two opposite views were and still are widely found in the professional literature:

1. Reading is what reading is and everybody knows that; usually this translates to "reading is matching sounds to letters."
2. "Nobody knows how reading works." This view usually leads to a next premise: therefore, in instruction, whatever "works" is its own justification.

Both views are non-productive at best and at the worst seriously impede progress.

My effort has been to create a model of the reading process powerful enough to explain and predict reading behavior and sound enough to be a base on which to build and examine the effectiveness of reading instruction. This model has been developed using the concepts, scientific methodology, and terminology of psycholinguistics, the interdisciplinary science which is concerned with how thought and language are interrelated. The model has also continuously drawn on and been tested against linguistic reality. This reality has taken the form of close analysis of miscues, unexpected responses in oral reading, produced by readers of widely varied proficiency as they dealt with real printed text materials they were seeing for the first time.

The model isn't done yet. No one yet claims a "finished" model of any language process. But the model represents a productive usable view of what I believe, at this point in time, about the way the reading process works.

A Definition of Reading

Reading is a receptive language process. It is a psycholinguistic process in that it starts with a linguistic surface representation encoded by a writer and

ends with meaning which the reader constructs. There is thus an essential interaction between language and thought in reading. The writer encodes thought as language and the reader decodes language to thought.

Further, proficient readers are both efficient and effective. They are effective in constructing a meaning which they can assimilate or accommodate and which bears some level of agreement with the original meaning of the author. And readers are efficient in using the least amount of effort to achieve effectiveness. To accomplish this efficiency readers maintain constant focus on constructing the meaning throughout the process, always seeking the most direct path to meaning, always using strategies for reducing uncertainty, always being selective about the use of the cues available and drawing deeply on prior conceptual and linguistic competence. Efficient readers minimize dependence on visual detail. Any reader's proficiency is variable depending on the semantic background brought by the reader to any given reading task.

Source for the Model

All scientific investigation must start with direct observation of available aspects of what is being studied. What distinguishes scientific from other forms of investigation is a constant striving to get beneath and beyond what is superficially observable. That involves finding new tools for making otherwise unavailable aspects observable. Such a tool is the microscope in all its variations designed to extend observation far beyond the limits of the human eye. Scientists also devise classification systems, taxonomies, paradigms as they constantly seek for essences, structures, interrelationships; they are aware of the distractions the obvious can cause and they are aware of how easy it is to overlook vital characteristics of phenomena they study.

The primary source of data for the view of the reading process presented here is observation of oral reading. But little can be learned from such observation if a naively empirical position is maintained. As the chemist must peer into the molecular structure, as the astronomer must ponder the effects of heavenly bodies on each other, as the ecologist must pursue the intricate web of interrelationships in a biological community, so the scientist in dealing with reading must look beyond behavior to process. Understanding reading requires depth analysis and a constant search for the insights which will let us infer the workings of the mind as print is processed and meaning created.

Oral miscue analysis is the tool I've found most useful in the depth analysis of reading behavior as I've sought to understand the reading process (Goodman, 1969).

Miscue analysis compares observed with expected responses as subjects read a story or other written text orally. It provides a continuous basis of comparison between what the readers overtly do and what they are expected to do. A key assumption is that whatever the readers do is not random but is the result of the reading process, whether successfully used or not. Just as the observed behavior of electrons must result from a complex but limited set of forces and conditions, so what the readers do results from limited but complex information sources and interactive but limited alternatives for their use.

When readers produce responses which match our expectations we can only infer successful use of the reading process. When miscues are produced, however, comparing the mismatches between expectation and observation can illuminate where the readers have deviated and what factors of input and process may have been involved. A simple illustration: there has long been concern over reversals in reading, changes in the sequences of letters, apparently involved in word substitution miscues. If was is substituted for saw there appears to be some kind of visual or perceptual aberration in the reader. Our miscue analysis data, however, tells us two things: (1) Such reversals are far less common in reading continuous texts than in word lists. (2) When such reversals do occur they are in only one direction: saw is replaced by was but virtually never is was replaced by saw. The reversal miscue must be influenced by factors other than the obvious visual or perceptual ones. Frequency, syntactic predictability and the range of semantic possibility clearly are involved.

In this depth miscue analysis several basic insights have emerged which have become foundational both to the research and to the model of the reading process:

* Language, reading included, must be seen in its social context. Readers will show the influence of the dialect(s) they control both productively and receptively as they read. Further, the common experience, concepts, interests, views, and life styles of readers with common social and cultural backgrounds will also be reflected in how and what people read and what they take from their reading.
* Competence, what readers are capable of doing, must be separated from performance, what we observe them to do. It is competence that results in the readers' control of and flexibility in using the reading process. Their performance is simply the observable result of the competence.

  Change in performance, whether through instruction or development is important only to the extent that it reflects improved competence. Researchers may use performance or behavioral indicators of underlying competence but they err seriously in equating what readers do with what they are capable of doing.
* Language must be studied in process. Like a living organism it loses its essence if it is frozen or fragmented. Its parts and systems may be examined apart from their use but only in the living process may they be understood. Failure to recognize this has led many researchers to draw unwarranted and misconceived conclusions about both reading and reading instruction from controlled research on aspects of reading such as word naming, word identification, skill acquisition, and phonic rule development.

  Researchers, particularly, have tended to fall into the unexamined view that reading is recognizing the next words. An example is the study of reading acquisition by Singer,

Samuels and Spiroff (1974).

They concluded that words were more easily "learned" in isolation than in text or with illustration. They drew this conclusion from a study in which four (4) words were taught to a number of learners in three conditions:

(a) in isolation
(b) in "context": each word was presented in a three word sentence.
(c) with an illustrative picture.

The key misconception in this study is that reading is a matter of identifying (or knowing) a series of words. It is then assumed that learning to read is learning to identify or know words. Further it is assumed that known words are known under all linguistic conditions. Implicit is the assumption that the task of "learning" four (4) words is representative of the general task of learning to read.

* Language must be studied in its human context. It is a uniquely but universally human achievement. That's not a humanistic assertion. It's a scientific fact. Human language learning and the general function of language in human learning are not usefully described with learning theories derived from study of rats, pigeons, and other non-language users.

A Revised Model

Three kinds of information are available and used in language, whether productive or receptive. These come from (1) the symbol system which uses sounds in oral languages and graphic shapes in written languages. For literate language users of alphabetic languages there is also a set of relationships between sounds and shapes; (2) the language structure which is the grammar, or set of syntactic relationships that make it possible to express highly complex messages using a very small set of symbols. The same syntax underlies both oral and written language; (3) the semantic system which is the set of meanings as organized in concepts and conceptual structures. Meaning is the end product of receptive language, both listening and reading; but meaning is also the context in which reading takes on reality. Listener/readers bring meaning to any communication and conduct themselves as seekers of meaning.

A model of the reading process must account for these information sources. It must also respond to the following realities:

Written language is displayed over space in contrast to oral language which is displayed in a time continuum.

Writing systems make arbitrary decisions about direction in using space. The reader must adjust to a left-to-right, right-to-left, top-to-bottom, or other arbitrary characteristic of written language.

Reading employs visual input. The eye is the input organ. It has certain characteristics and limitations as an optical instrument. It has a lens which must focus; it requires minimal light; it has a limited field; the area of view includes a small area of sharp detail.

Reading must employ memory: it must hold an image, briefly store information, retain knowledge and understanding.

Cycles

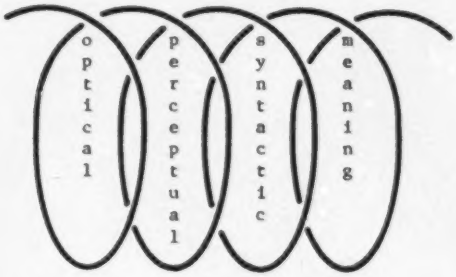

Figure 1

Though reading is a process in which information is dealt with and meaning constructed continuously, it can be usefully represented as a series of cycles. Readers employ the cycles more or less sequentially as they move through a story or other text. But the readers' focus, if they are to be productive, is on meaning so each cycle melts into the next and the readers leap toward meaning. The cycles are telescoped by the readers if they can get to meaning.

Processes

As the readers move through the cycles of reading they employ five processes. The brain is the organ of information processing. It decides what tasks it must handle, what information is available, what strategies it must employ, which input channels to use, where to seek information. The brain seeks to maximize information it acquires and minimize effort and energy used to acquire it. The five processes it employs in reading are:

I. Recognition-initiation. The brain must recognize a graphic display in the visual field as written language and initiate reading. Normally this would occur once in each reading activity, though it's possible for reading to be interrupted by other activities, examining pictures, for example, and then to be reinitiated.

THE REVISED MODEL

Cycles	Inputs	Output
Start Recognize task as reading known language	Graphic Display Memory: Recognition-Initiation Activate strategies in memory	Optical scan cycle
1. OPTICAL a. Scan in direction of print display	Start: Memory: Strategies for scanning appropriate to graphic display. Adjust speed of scan to processing speed.	Optical fixation cycle To memory: predict relation of information to direction of display.
b. Fix-focus eyes at point in the print.	Light reflects from graphic display. Visual field includes sharp and fuzzy input. Memory: Prior prediction of meaning, structure, graphic redundancy, expectation of locus of key graphic cues.	Perception Cycle To Memory: Cues for image formation.
2. PERCEPTION a. Sample - Select. Choose cues from available graphic display.	Fix: cues available in sharp and blurred input. Memory: Sampling strategies Prior predictions and decodings to meaning.	To Memory: Selected cues To Feature Analysis
b. Feature Analysis: Choose features necessary to choose from alternate letters, words, structures.	Sampled features. From memory: Assign alloystem(s) (type style, cursive, etc.) Prior predictions.	Confirm prior prediction. Correct if necessary by return to scan, fix. If no system available, try best approximation or terminate; otherwise proceed to image formation.

c. Image Formation Form image of what is seen, and expected to be seen. Compare with expectations.	From: feature analysis, cues appropriate to allosystem(s) chosen. From memory: graphic, syntactic, semantic constructs Prior predictions Cues from parallel phonological system (optional)	If no image possible, return to feature analysis or prior cycle for more information. Confirm prior predictions. If correction needed return to prior cycle, scan back for source of inconsistency. If image formed, store in memory and go to syntactic cycle.
3. SYNTACTIC CYCLE a. Assign internal surface structure.	From image formation From Memory: Rules for relating surface display to internal surface structure. Prior predictions and decodings.	If no structure possible, recycle to perception or optical cycles. If inconsistent with predictions, try alternate or correct by recycling and scanning back to point of mismatch. If structure is possible, go to deep structure.
b. Assign deep structure. Seek clauses and their interrelationships.	From: Internal surface structure. From Memory: Transformational rules for relating surface and deep structures. Prior predictions and decodings.	If no structure possible try alternative. If still no structure, recycle. If inconsistent with prediction, correct by recycling. If deep structure possible, predict graphic, semantic, syntactic features. Go to Meaning. If oral reading, assign appropriate intonation contour. Terminate if no success.

4. CONSTRUCT MEANING a. Decode	From: Deep structure From Memory: Stored experiences, conceptual constructs, lexicon. Prior predictions.	If meaning not acceptable, recycle to point of inconsistency. If no meaning possible, try alternate deep structure or recycle to seek more information. If still no meaning, hold all information in memory and return to scan. Terminate if no meaning results. If acceptable meaning, go to assimilate accommodate.
b. Assimilate/Accommodate If possible, assimilate. If not possible, accommodate prior meaning.	From: decode From memory: Prior predictions, prior meaning. Conceptual and attitudinal constructs.	If no assimilation possible and no accommodation possible, recycle to correct or obtain more information. If still not possible, hold and return to scan for possible clarification as reading progresses. Accommodations possible: modify meaning of story/text to this point modify predictions of meaning modify concepts modify word definitions restructure attitudes If task complete, terminate. If task incomplete, recycle and scan forward, predict meaning, structure, graphics.

II. Prediction. The brain is always anticipating and predicting as it seeks order and significance in sensory inputs.

III. Confirmation. If the brain predicts, it must also seek to verify its predictions. So it monitors to confirm or disconfirm with subsequent input what it expected.

IV. Correction. The brain reprocesses when it finds inconsistencies or its predictions are disconfirmed.

V. Termination. The brain terminates the reading when the reading task is completed, but termination may occur for other reasons: the task is non-productive; little meaning is being constructed, or the meaning is already known, or the story is uninteresting or the reader finds it inappropriate for the particular purpose. At any rate, termination in reading is usually an open option at any point.

These processes have an intrinsic sequence. Prediction precedes confirmation which precedes correction. Yet the same information may be used to confirm a prior prediction and to make a new one.

Short Circuits

Any reading which does not end with meaning is a short circuit. Readers may short circuit in a variety of ways and for a variety of reasons. In general, readers short circuit (1) when they can't get meaning or lose the structure; (2) when they've been taught or otherwise acquired non-productive reading strategies; (3) when they aren't permitted to terminate non-productive reading. Theoretically, a short circuit can occur at any point in the process. Here is a list of short circuits with successively more complex points:

Letter Naming: A very old method of reading instruction taught young readers to spell out to themselves any unfamiliar words. This short circuit still occurs but it is not too common.
Recoding: Since print is a graphic code and speech is also a code, it is possible for readers to concentrate on matching print to sound with no meaning resulting. Since the readers go from code to code such short circuits may be considered recoding. Recoding may take place on several levels. Letter-sound recoding is the most superficial. Sounds are matched on a one-to-one basis to the print. This sounding-out requires the readers to blend sounds to synthesize words. Pattern-matching recoding involves the readers fitting spelling patterns to sound patterns. Readers focus on features which contrast patterns such as rat-rate, hat-hate, mat-mate. Recoding is often by analogy: since bean looks like mean it must sound like it too. This recoding produces words or word-like utterances without requiring synthesizing.
Internal surface-structure recoding involves using the rules needed to relate print to underlying surface structure. Instead of going beyond to deep structure, however, the reader generates an oral

surface representation. This recoding can produce words and phrases with approximate intonation patterns.

Syntactic Nonsense. The readers may treat print as syntactic nonsense, generating an appropriate deep structure without going beyond to meaning. Even proficient readers resort to this short circuit when conceptual load is too great or when the lack relevant background. With this short circuit the oral reading may be relatively accurate and yet involve little comprehension. Because readers do employ this short circuit we have come to regard the separation of syntactic deep structure from meaning as a useful view.

Partial structures. Readers may resort to one or more of these short circuits with alternating periods of productive reading. Furthermore, because the brain is always actively seeking meaning, some comprehension will often "leak" through even the most nonproductive short circuits. It will most likely result in fragments of meaning, a kind of kaleidoscopic view, rather than an integrated understanding.

I suspect that many of these short circuits result from instruction but the studies to demonstrate this remain to be done.

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THE ROLE OF PREDICTION IN READING[1]

Frank Smith

The assertion is that it is not possible to read meaningfully without prediction--and since it is only through reading that children learn to read, it follows that the opportunity to develop and employ skills of prediction must be a critical part of learning to read. However, it is not necessary that prediction should be taught; prediction is as much a part of spoken language comprehension as it is of reading, and a child with sufficient verbal ability to understand written material that is read to him has both the competence and the experience to direct his ability in prediction to reading.

My aim is to demonstrate that prediction is essential for reading, that everyone who can comprehend spoken language is capable of prediction, and that prediction is routinely practised in reading, by beginners as well as fluent readers. I shall explain more precisely what I mean by prediction after outlining why it is necessary in reading.

Four reasons for prediction

1. Individual words have too many meanings. Every word in our language is multiply ambigious, and the most common words have the most meanings. Everyday words like come, go, have, take, table, chair not only have a multiplicity of different meanings, they are often also ambiguous as to their grammatical function. How is the word house pronounced? The word cannot even be articulated until the reader knows whether it is a noun or a verb. The most common words in any language, the prepositions, have so many different meanings they take up more space in dictionaries than words in any other class. It should be noted, however, that speakers and writers are almost never aware of this potential ambiguity, and that listeners and readers are rarely aware of the multiplicity of possible meanings either.

2. The spellings of words do not indicate how they should be pronounced. There are over 300 "spelling-to-sound correspondence rules" of English, and there is no rule that will specify when any of these particular rules must apply, or when the spelling to be "sounded out" is an exception. The rules of phonics are highly complex. To take a very simple example, how should a word beginning with HO...be pronounced? The answer depends on whether the ho is followed by ..t, ..ot, ..ok, ..rizon, ..use, ..rse, ..pe, ..ney, ..ist, ..ur, ..nest, eleven different possibilities (all depending on what follows the initial

letters, indicating that phonics must be applied from right to left).

3. There is a limit to how much of the "visual information" of print the brain can process during reading. Flash a line of about thirty random letters on a screen for about a tenth of a second and the most an experienced reader will be able to recognize is four or five letters. This four-letter or five-letter limit in fact represents an entire second of visual information processing. And during the second that it takes the brain to decide what these five letters are, it is not possible for anything else to be seen--a condition that can be characterized as "tunnel vision." In other words, for as long as one is trying to identify letters one after the other, reading is an impossibly slow and restricted process.

4. The capacity of short-term memory (or "working memory") is limited. Not more than six or seven unrelated items--say an unfamiliar telephone number--can be held in short-term memory at any one time. Try to overload an already filled short-term memory and other information will be lost. As a consequence, it is virtually impossible to read a word more than four or five letters long a letter at a time. By the time the end is reached, the beginning will be forgotten. It is similarly impossible to store the first words of a sentence while waiting to get to its end before making a decision about meaning. By the time the end of the sentence is reached, the beginning will have been forgotten.

Defining prediction

There is a common feature underlying the four "reasons for prediction" that have just been listed--in each case the brain is confronted by too many possibilities; it must decide among more alternatives than it can handle. Decision-making takes time, and there is a fundamental rule that applies to every aspect of decision-making, whether it involves the identification of a single letter or word in a line of type, or the comprehension of a sentence or an entire book. The fundamental rule is this: the greater the number of alternatives, the more time is required for a decision. Recognition is never instantaneous. We may be able to identify a letter or a word if it comes from a small set of known alternatives--when we know in advance that it is a vowel, or the name of a flower--but the same letter or word will be quite unrecognizable if it comes from a larger set of alternatives. The reason for this bottleneck is simple: the greater the number of possible alternatives, the more information the brain has to process in order to reach a decision. The art of fluent reading lies in the skilled reduction of the amount of visual information the brain has to process. If you know a letter will be either A or B, you need only a glimpse of that letter to decide which it is. But if the letter could be any one of the 26 letters of the alphabet, much more visual information will have to be taken into account.

I can now offer my general definition: prediction is the prior elimination of unlikely alternatives. In the jargon of Information Theory, prediction is the reduction of uncertainty. The qualification "unlikely" in the preceding definition must be emphasized. "Prediction" in the sense in which I am using the word does not mean wild guessing, nor does it mean staking everything on a

simple outcome. Rather prediction means the elimination from contention of those possibilities that are highly unlikely, and the examination first of those possibilities that are most likely. As we shall see, such a procedure is a highly efficient--and natural-procedure for making decisions involving language.

Prediction in operation

Imagine that I have written the 26 letters of the alphabet on 26 index cards, one letter to each card, and that I shuffle the pack of cards, select one at random, and ask you to guess what that card is. You could very rightly object that since every letter is equally probable, nothing you know could in any way increase your chances of making a correct guess. Whatever letter you might choose to guess, the probability that you will be correct is exactly the same, namely one in 26. On the average you would expect to have to make 13 guesses before you are likely to be right.

However, letters do not occur randomly in the English language. Some have a much higher probability of occurrence than others, for example the most common letter E is forty times more likely than the least common letter Z. If I asked you to guess the 17th letter of the 5th line of the 23rd page of a random sample of 1,000 books in any library, you would be correct forty times more often if you guessed E every time than if you consistently guessed Z. So when a letter is selected at random from English text, your prior knowledge of the language can obviously make a difference to your chances of making a correct guess.

It is easy to demonstrate that people can and do use their knowledge of the relative probabilities of English letters in this way--knowledge that often they are not aware that they have. For example, one can ask an audience of several hundred people to write down their guess of what the first letter of a pre-selected six-letter word might be. In the example I demonstrated at the Symposium the pre-selected word was STREAM. The majority of people will write E, T, A, I, O, N, S, H, R, D, L or U--which happen to be the 12 most frequent English letters in order of frequency. Scarcely anyone will predict Z, or Y, or J. Usually S happens to be the most common guess for the initial letter of six-letter words, by about one person in eight (as opposed to the one in 26 that would be expected if guesses were made at random). Tell an audience that the first letter is indeed S, and fully half of them will correctly guess the second letter T first time, and fully half again will guess that the third letter is R. Most people will then correctly guess that the fourth letter is E, and go on to be incorrect with their guess that the following letter is another E, although they will be correct on their second attempt with A. These days, K is usually the guess for the final letter, with M the successful second guess. In other words, by using their prior knowledge of the relative frequency of letters and groups of letters in English, people rarely have to labour through a dozen or more unsuccessful guesses before they can decide what the next letter of an unknown word might be. The average number of guesses is about three. (The statistically computed average number of alternatives that successive letters of English words might be is seven or eight). The effect of such prior knowledge

is considerable. Most English words remain recognizable if every other letter is obliterated, demonstrating that we scarcely have to look at most letters to identify them in words. A more graphic illustration of the saving that the prior elimination of unlikely alternatives can accomplish is that a single glance at a sequence of random words on a screen is usually sufficient to permit the recognition of two or three words, or twice as many letters than could be recognized if the letters flashed on the screen had been randomly selected.

But readers know far more about language than the relative likelihood of particular letters in isolated words. We can make excellent guesses about words in sentences. Take any book that happens to be handy, read the last couple of lines of a right hand page, and then guess what the next word will be when you turn the page. You will not be right every time of course, but you will almost always guess a word that is possible. Remember, what is important is not to be absolutely correct, but to eliminate unlikely alternatives. Once again, statistical analyses of English texts have shown that although in theory an author might draw from a pool of fifty-thousand words or more for the words he will use in a book, there are on the average no more than 250 alternatives available to him when he writes any particular word in that book. The reader does not have the exact word that will confront him. Nor need he predict more than a few words ahead. But if he can reduce the number of immediate alternatives from many thousands to a couple of hundred, he is taking a considerable burden from the limited information-processing capacity of the brain. Once again our illustrative experiment will demonstrate this saving: if the sequence of 30 letters flashed briefly on a screen comprises a single coherent sentence or meaningful phrase, then the viewer can usually see it all at one glance.

There have been hundreds of experiments showing that sequences of letters and words are identified faster, more accurately, and with less visual information, the more they correspond to possible sequences in the English language. The experiments demonstrate not only that individuals, including children, have a considerable prior knowledge of language that enables them to eliminate many unlikely alternatives in advance, but that this knowledge is exercised automatically, without the individual's awareness and without specific instructions to do so. But the prior rejection of unlikely alternatives is a characteristic of the way the human brain works. The reason we are rarely surprised by anything we see, even when we visit an unfamiliar setting, is that we always have a set of prior expectations about what we will in fact see. We do not predict everything--we would be surprised to see a camel in the harbour or a submarine in the zoo, but not vice versa. Nor are our predictions over-specific--we rarely predict exactly what we shall see next. Instead, we quite automatically and subconsciously eliminate unlikely possibilities from consideration.

The advantages of prediction

Prediction in reading, I have argued, involves the prior reduction of uncertainty by the elimination of unlikely alternatives. We never make our decisions as if we had no prior expectation--recognition and comprehension in such circumstances would always be disruptively time-consuming and tedious.

Instead we seek just enough information to decide among the alternatives that are most likely. As a result, the four limitations on reading that I have discussed as reasons for prediction are very easily overcome, and there are two other advantages as well.

1. Most words have many meanings--but if we are predicting, then we are usually looking for only one meaning of any particular word. You may not be able to guess if the next word is going to be table or chair, sideboard or coat-rack, but if you know that it will refer to a piece of furniture, you will not even consider that table might be a set of numbers, or chair a verb. The reason neither speakers and writers are aware of the potential ambiguity of what they say is that they already know the meaning they are trying to express and do not consider alternative possibilities; they are embarrassed if a double-meaning is pointed out to them. Similarly listeners and readers expect a certain meaning--if they are following (or rather predicting) the sense of what they are trying to comprehend--hence puns are so excruciating when eventually we manage to see them. Words may have a multiplicity of meanings and grammatical function taken one at a time, but in meaningful sentences they are rarely ambiguous.

2. The pronunciation of words may not be predictable from their spellings, but if you know what a word is likely to be, it is not difficult to use "phonics" to confirm or reject a particular expectation. As all reading teachers know implicitly, phonics is easy if you already have a good idea what the word is in the first place. If a child can predict that the next word is likely to be either cow, horse, or sheep, he will not need much knowledge of spelling-to-sound correspondences to decide what it is. It is in fact through such prediction that a mastery of useful phonic skills is acquired.

3. Obviously, prediction will speed up reading, and therefore help to overcome the limitation imposed by the brain's rather sluggish rate of information processing. The fewer alternatives you consider, the faster you can read, the more efficient will be the reading that you accomplish. Reading with prediction means that the brain does not have to waste time analyzing possibilities that could not possibly occur.

4. The limited capacity of short-term memory is overcome by filling it always with units as large and as meaningful as possible. Instead of being crammed uselessly with half-a-dozen unrelated letters, short-term memory can contain the same number of words, or better still, the meaning of one or more sentences. In fact prediction works better at these broader levels; it is easier to predict meanings rather than specific words or letters, and very few letters or words need to be identified to test predictions about meanings.

5. The first of the bonus advantages of prediction in reading is that the reader is working already at the level of meaning--his reading is meaningful before he even begins. Instead of trying to slog through thickets of meaningless letters and words in the fond hope that eventually some nugget of comprehension will arise, the reader is looking for meaning all the time. If any possibility of meaning is to be found in a text, the predicting reader is the one who will find it.

6. The final advantage is of particular practical importance in many

classrooms, namely that with prediction it does not matter if the reader's language does not exactly match that of the writer. Everyone can understand language that he could not possibly produce; that is why parents quickly learn to conduct their more intimate conversations out of the hearing of their pre-school children, yet the language ability of children in schools is all-too-often evaluated by the speech that they produce. Few readers, even adults, can succeed in threshing out the sound of a sentence, word for word, unless they have a good prior idea of what the sentence as a whole means. There is no way a child can be expected to identify words as a preliminary to getting the meaning if the words are in fact not among those he would choose himself to express such a meaning. But with prediction, a "one-to-one match" is not required. It will not matter if a child thinks the author has written "John ain't got no candy," rather than "John has no candy," provided he gets the meaning--and provided the teacher is not demanding literal word-for-word accuracy.

Prediction in the classroom

Two basic conditions must be met if a child is to be able to predict in the manner that is essential for learning to read. The first condition is that the material from which he is expected to learn to read must be potentially meaningful to him--otherwise there is no way he will be able to predict. The opposite of meaningfulness is nonsense, and anything that is nonsensical is unpredictable. Any material or activity that does not make sense to a child will make it more difficult for him to read.

But meaningfulness of materials and activities is not enough--a child must also feel confident that he is at liberty to predict, to make use of what he already knows. With prediction there is a constant possibility of error--but then readers who read without ever making errors are not reading efficiently, they are processing far more information than is usually necessary. The child who will become a halting, inefficient reader is one who is afraid to make a mistake. The worst strategy for any reader who is having difficulty understanding text is to slow down and make sure that every word is identified correctly.

The notion that prediction should be encouraged worries many teachers; it may sound as if a virtue is being made out of error. But one should distinguish prediction from reckless guessing. The guesser is usually the child trying to achieve what the teacher is demanding and getting every word right, no matter how little relation it bears to sense. A striking characteristic of older children with low reading ability is that they read as if they have no expectation or interest that the material might make sense, but are determined to get the words right at all costs.

Besides, accuracy is overrated. There are only two possibilities for a mistake made during reading--either the mistake will make a difference to the meaning, or it will not. If the mistake will make no difference--if the child reads "house" instead of "apartment"--then it will make no difference. There is no need to worry. But if the mistake does make a difference--if he reads "house" instead of "horse"--then the reader who is predicting will subsequently

notice the anomaly, simply because he is following the meaning. The child who overlooks obvious errors of sense is not the child who rushes through to understand gist, but the one who tackles the passage one word at a time.

How then can prediction be taught? There are some obvious methods, such as encouraging a child to guess what a difficult word might be, and playing reading games where the teacher stops suddenly, or leaves an occasional word out, or makes an occasional deliberate mistake. But more important I think is that prediction should not be discouraged. Prediction is a natural aspect of language. The preferred strategies for a child who meets an unfamiliar word in an interesting story he is reading are the same as those for fluent readers: first skip, and second guess. Sooner or later the child will have to predict if he is to become a fluent reader. Feedback is an essential part of all learning activities, but it can come too soon, or too often. A child who pauses before he identifies a word may not want the teacher to help him to "sound it out," nor the rest of the class to tell him what it is--he may in fact know what the word is and simply be wondering what it has to do with the rest of the sentence. A child who "makes a mistake" need not be "corrected" by having the teacher--or the rest of the class--put him right immediately. If left to himself, he might self-correct in the following sentence, a far more valuable skill in reading than the blind ability to word-call. One of the beautiful advantages of reading sense is that it provides its own feedback; errors become self-evident.

One of the most formidable impediments to prediction--at all levels of reading--is anxiety. A child who is afraid to make a mistake is by definition anxious, and therefore unwilling to take the necessary risks of predicting. An individual of any age labelled as a reading problem will show anxiety, especially in situations where he feels he is being evaluated; his reluctance to predict will lead to laborious and nonsensical reading, and his "difficulty" will become a self-fulfilling prophecy.

Prediction is not everything in reading. Other important considerations include the efficient use of short-term memory, the minimal use of visual cues, and the selection of an appropriate rate of speed for particular reading tasks, together with the acquisition of effective strategies for the identification of unfamiliar words from context. But these are all skills that come primarily through the practice of reading; they are fostered rather than taught (in fact many teachers are not aware of the extent to which these skills are involved in reading). The advantage of prediction is that it facilitates precisely the kind of confident, successful, and meaningful reading practice through which all of the critical skills of reading are acquired.

NOTES

[1]Empirical support for the theoretical assertions made in this paper, and more complete treatment of many of the issues raised, will be found in two books by Frank Smith--Understanding Reading (1971) and Psycholinguistics and Reading (1973), both published by Holt, Rinehart and Winston, New York.

PRAGMATICS: STILL ANOTHER CONTRIBUTION OF LINGUISTICS TO READING

Roger W. Shuy

It has always amused linguists that the field of reading would allow to develop the notion that there is such a thing as "a linguistic approach to reading." One of the more obvious aspects of the act of reading (in most languages at least) is that, in some mysterious way, the knowledge of his language that a reader possesses is called upon and made use of. There can be little question about this activity among most readers who are speakers of alphabetic languages. This is not to say that such readers do not also call on other skills. Undoubtedly they make heavy use of the very stuff of psychology, but we have yet to hear of "The psychology approach to reading." It seems rather clear that social and cultural knowledge are also called upon by the reader but there has been no discernible rush to establish a "sociological approach to reading." The major principles of information processing are utilized in the reading process but no movement seems to be fomenting for "an information processing approach to reading." Why linguistics has been singularly blessed with such a burden is not at all clear but the phenomenon is certainly apparent when state textbook selection committees (as in Texas) set up "The linguistic approach" as a category of reading materials which must be represented on the state adoption list.

At first blush it would appear that linguists could be happy to be so highly valued by reading teachers but a closer examination of the situation will reveal that the attention paid by reading specialists to linguists has been superficial, fragmented and misguided. The reasons for this warped view of the field are not entirely the fault of the reading establishment. Linguists must share the blame, largely because they are generally unaware of what is going on under the name of linguistics in this field. But here, as on every other occasion in which the excuse is utilized, ignorance is certainly not excusable.

Linguists, for example, have known for some time that their field involves a great deal more than phonology. Yet all through the fifties and sixties the term linguistics was synonymous with letter-sound correspondences for most people in reading research, materials development and teaching. Such awareness was often accompanied by sighs of relief that however esoteric this new linguistics might be, it at least bore some similarity to more comfortable phonics, giving birth to the enduring confusion between phonetics and phonics, a distinction made clearly by Charles Fries but missed completely by those who chose not to see it.

Another trivialization of the presumed linguistic approach to reading came

about as a result of efforts to apply the then orthodoxy of language teaching to the reading process. Repetition drills were very popular at that time and it was naturally assumed that sentences like "Nan can fan Dan" would bring systematic, predictable regularity to the otherwise chaotic chore of learning to read. Now linguistics meant two things: noise making and repeated noise making. Where linguists were hibernating through all of this is not very clear. Those who were not languishing in their ivory towers of Old Irish pronouns were undoubtedly ignorant of the fact that language contains words, grammar, sentences, discourse, context and, above all, meaning, or they could not observe the underlying sense of it all. At any rate, a new orthodoxy developed and "Nat the fat rat" came into prominence and the linguistic approach was redefined.

Largely through the efforts of Kenneth Goodman, Frank Smith and their colleagues and students, a counter movement to the obviously overdrawn focus on language units smaller than a word developed. The new evidence, impressively researched and eloquently presented, argues against decoding and for moving immediately to syntax processing. Linguistics is again redefined to include sentence and discourse level processing. The major objection to this healthy infusion of new blood into the reading process is that it tends to categorically reject other legitimate language processing units. To be sure, letter-sound correspondences are grossly overemphasized in most reading programs and it may well be that by paying continuous attention to only the phonological language access in reading, more students are lost from boredom than from ignorance or willful slothfulness. In any case, borrowing their premises from classical generative grammar, Goodman and Smith see reading as syntax or discourse processing of meaning units, not the one-to-one decoding of sound units. This healthy advance in understanding how language processing takes place in reading is generally referred to as psycholinguistics and reading.

Not in disagreement with the excellent notions of Goodman and Smith but in reaction to the still apparent incompleteness of this concept of linguistics, I convened a symposium on linguistics and reading at the 1973 New Orleans meeting of the International Reading Association. It was my contention that many aspects of linguistics, could be brought to bear on the act of reading besides those of phonology and grammar. Sociolinguistics, for example, is one such area. Another is a rapidly developing field of study shared by anthropologists and linguists generally referred to as the ethnography of communication. In addition, we need to know a great deal more about the interrelationship of child language acquisition and the ways in which he acquires reading skills and processing. The area of linguistics which seemed most attractive, however, grows out of a developing theory which exists almost in reaction against the excesses of generative grammar. Recently the term pragmatics has come to be used by linguists to refer to the task of recording and explaining a portion of linguistic reality. Pragmatics is generally concerned with the broader role of context as it is related to the beliefs and attitudes of the participants in a communication event. It deals with their status relationships and the purpose or intent of their communication.

This developing interest in pragmatics by linguists grows out of the

controversy about whether or not syntax can be dealt with in isolation from meaning. Oddly enough, the fields of linguistics and reading had both tried, for a lengthy period, to separate meaning from the major thrust of their work. One might legitimately ask what the concept of reading might refer to if it does not involve meaning. One also might question what the field of grammar might denote if meaning continued to be separated from the analysis. But even the more traditional generative grammarians, those who believe that syntax should be studied autonomously, must work with a meaning-preserving hypothesis. That is, they must assume that stages in the derivation of a grammar related by transformational rules must not differ in meaning (Griffin, 1974). To preserve such a hypothesis, it is necessary to speculate about the factors that contribute to meaning. It is obvious that some differences in meaning are smaller than others and some are more inconsistent and are considered to be pragmatic. Meaning differences which are large and consistent are considered semantic. Therefore, linguists interested in semantics should include references to pragmatics. More specifically, linguists who have begun to question the completeness or appropriateness of the body of linguistic facts which have traditionally been considered to be the subject matter of linguistics have come to consider the appropriateness of pragmatics as a necessary beginning point in linguistic analysis. There are three essential claims made by such linguists:

1. That native speakers know not only the form of sentences but also the appropriate use of them.
2. That native speakers understand the relationship between sentences which are formally, syntactically and semantically distinct.
3. That native speakers can carry on conversations with sentences that the syntax and semantics does not predict, but that seem regular and predictable.

To account for these factors of language use in natural context, linguists make use of the pragmatics of natural language.

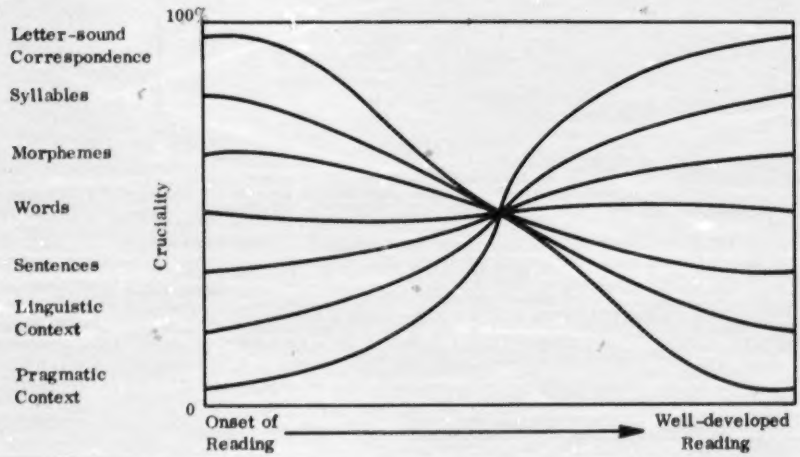
It seems obvious, then, that pragmatics deals with the aspects of meaning that are token oriented, not type oriented. That is, the element to investigate is the utterance, not the sentence. Furthermore, the utterance must be investigated in a well-defined context. The major question underlying the study of pragmatics involves a decision about where the difference between semantics and syntax actually resides.

Whenever a new development in linguistics takes place it seems appropriate to consider how such developments relate to reading. It would seem that the major contributions of such developments would be at the middle-level of reading rather than at the level of the onset of reading development.

At this point, it may be appropriate to point out what appears to be a contrast between the position of Goodman and Smith from my own stance on the relationship of reading to language processing. Whereas Goodman and Smith appear to deny the usefulness of early level decoding, I stress its usefulness, but by no means to the extent attributed to it by most commerical reading

materials. It is my position, in fact, that learning to read involves both the mundane behavior skills stressed by traditional reading programs and the cognitive processes argued for by Goodman and Smith. My position on what happens in the learning-to-read process is that at the onset of reading, the more behavioral processes tend to dominate, but as the reader learns more and more about reading, he calls more and more on cognitive strategies, especially those which involve processing larger and larger language accesses. More precisely, at the onset of reading, the reader processes letter-sound correspondences, a skill which one learns primarily in order to begin to deny it in favor of other more cognitive strategies later on.

A schematic illustration of my theory of the language accesses involved in the reading process is the following:



It should be clear, however, that this schematic illustration is not a description based on research but rather it is a reasonable estimate of what is likely to be the case once the necessary research has been done. Of particular importance is that it displays letter-sound correspondence as crucial at the onset of learning to read, then decreasingly important as the learning-to-read process develops. Similar progression can be noted for each of the other language accesses, with particular focus, in the case of pragmatics, on the increasing significance of context and discourse. Note especially that both accesses are available and important at the onset of learning to read but of relatively low cruciality at that time. As the learner continues to progress, however, he calls less and less on the word to sub-word level accesses and more and more on the language accesses that are larger than word level.

At this point it should be noted that most language learning activity parallels the learning to read progression insofar as the early stages of learning are relatively clear cut and show obvious gains whereas the middle and advanced

stage of language learning are less well-known and obvious. That is, in almost every case, the stages in the beginning courses in language learning are relatively well known and measurable but, as the learner progresses, the exact stages in his program are less and less clear. From a commercial viewpoint, we know considerably more about how to construct introductory courses than we do about how to construct advanced ones.

The parallels to reading instruction should be clear. Historically we have developed reasonably good onset reading programs but increasingly ineffective advanced ones. Most children who are learning to read show predictable gains during the first year or so, then demonstrate, according to our admittedly weak measurement system, progressive fall off for the next few years. One contention of this paper is that a reason for this fall off is that the teaching program continues to focus on onset skill development at stages in which more appropriate strategies would involve larger and larger chunking of the language accesses. A second contention is that a teaching program in reading should be constructed to develop middle-level reading skills, a program which will call on a child's knowledge not only of syntax (as Goodman and others are doing) but also one which will make use of the child's pragmatic knowledge--his knowledge about how language is used. The remainder of this paper will be devoted to a set of suggestions for research and development along such lines.

In a recent paper on pragmatics, Griffin pointed out some obvious but little realized things which the act of reading can accomplish. It is depressing that the field of reading is so frequently conceived of as a methodology rather than a content. One important contribution of linguistics to reading has been to identify language and language processing in particular as one of the content areas of reading. More commonly, perhaps, reading is thought to provide an access to new knowledge through the way such knowledge is objectivized or unlocked by reading the words about it. Griffin suggests still another unlocking process, one which more clearly evidences the influence of pragmatics in reading. In an informal experiment, Griffin first had subjects read the following sentences:

> "Have you traveled much since you came to the Philippines?" Elsa asked Carol.
>
> "Well just in Cebu province. I went to Danao and Moalboal last month and last week I visited some friends in Talisay," Carol answered.

Many accomplished readers of English do not know the names of three towns in the province of Cebu in the Philippines. Before the reading task, subjects were asked to name three towns in the Philippines. If the three in the reading passage or any other actual towns were named, the subject was rejected. Then the passage was offered to the remaining subjects. After reading it, the subjects were asked to name some towns in Cebu province. Practically all subjects could name all three noted in the passage despite the fact that the passage at no point identifies them as towns. The places named could be, for example,

parts of one town for all the passage actually tells us. If the words of the passage do not tell the readers that the three cities are in Cebu province, how did the reader learn this? By calling on his knowledge of language pragmatics. The experiment demonstrates that reading can add to the reader's store of facts about the world that enter his knowledge base by means of language use rather than by objective semantic identity.

If the first sentence in the passage had read "Have you visited many towns..." instead of "Have you traveled much..." the reader would have been specifically clued with semantic matches for the three towns. But language is not always used so precisely and readers, like any other users of language, learn how to process pragmatically as well as semantically. One of the curious things about such a lack of semantic specificity is that human beings seem to be paradoxically programmed to need to be specific and, at the same time, to need to be subtly suggestive. It is well known that the use of connotation and synonymy allow for semantic subtlety. A second contribution to language subtlety appears to be available through the understanding of how meaning is accomplished through sentence use, or through the combined use of more than one sentence.

Since readers can acquire knowledge about the real world through language use, it would appear obvious that knowledge of the facts about language use in the real world is useful if not necessary for good reading. The readers in the Griffin experiment learned something that was not otherwise made explicit solely by means of their knowledge of language use. Why not encapsulate such knowledge in the development of a reading program? Language users do not have to depend on outright statements. Nor do they require or expect lengthy ones. In reading, as in normal oral language, there is much that is left unsaid. Such information is often implied by what is said and is often filled in by the reader in terms of his background knowledge of the real world.

The theory of reading I wish to support is one in which the learner eventually acquires the ability to spot implications, to understand what is left unsaid, to skip over redundancies, to spot the important, to skim over the unimportant and many other highly important cognitive processes. What we have lacked in order to build on such a theory has been a theory of language which will enable such reading research to be relevant and focused. Classical generative grammar could not provide such a theory. It avoided the very study of meaning as much as possible and cared less for non-linguistic context conditions. The contention of this paper is that the developing field of pragmatics is beginning to offer such a theory.

All of the exact types of information which may be implied from a discourse have not yet been satisfactorily determined. Even though such information is as yet unsettled, H. P. Grice's (1967) delimitation of conversational implicatures includes principles and maxims which shape the discourse.

Grice's cooperative principle says only that the contribution of participants in a conversation should follow the accepted principle of language exchange. Various maxims support this principle. The maxim of quantity requires that each contribution should be as informative as is required but not irrelevantly informative. The maxim of quality says only that each contribution

should not include what is believed to be false or lacking in evidence. The maxim of relation specifies that conversational participants should be relevant. The maxim of manner requires participants to avoid ambiguity, obscurity and disorder. Grice's contention is that the cooperative principle is necessary for language exchanges of any type to be successfully carried out. When these principles and maxims are violated, confusion and lack of comprehension follows. Yet such information, as has been noted earlier, has little or nothing to do with the literal content of the grammatical structures. Instead it relates to knowledge of how language is used in the real world.

In recent times, linguists interested in the pragmatics of natural language have begun to explore what is involved in processing such sentences as, "It certainly is hot in here" which, under proper contextual circumstances may be understood to mean "Please open the window" or "Turn down the thermostat." Likewise, we all know if, when seated at a dinner table, someone says "Can you pass the butter" one does not respond by saying "yes I can."

Thus, this aspect of language, little studied in any formal sense, provides us with facts about how semantic processing takes place when the surface manifestation of language, as in the sentence "It certainly is hot in here," bears little phonological or lexical relationship to the underlying meaning. Since a great deal of reading instruction is based on the presumed one-to-one relationship of written words to dictionary meaning, it is likely that pragmatic aspects of language have been almost totally neglected either as a potential problem or as a likely asset.

Children who are learning to read already know a great deal about language. They may not be able to articulate exactly what it is that they know (this comes later, in endless semesters of something called English grammar) but there can be little doubt about the fact that they know it. What linguists who study pragmatics add to this known situation is that these same children also know a great deal about language usage. That is, they know a great many of the language routines such as the "Can you please pass the butter" type noted earlier. In essence, what we need to know about the interface between the pragmatics of natural language and learning to read are several things:

1. What is the extent to which such knowledge is applied in reading?
2. What are the conflicts or potential conflicts that grow out of a difference between the aspects of pragmatics used by the writer and the aspects of pragmatics called upon by the reader?
3. What are the differences, if they exist, between the facts about language usage which a person calls upon in speaking and listening as opposed to reading and writing.

To this point we have focussed on the ways in which reading can offer new facts about the world if the reader will only call on his knowledge of how language is used. The obverse is equally true. If the reader does not have the appropriate facts about the real world and language usage available to him, he may not be able to read the passage in which such information is critical. Carol Chomsky's research shows that the developmental acquisition of certain

grammatical structures bears a direct relationship to the child's ability to process such structures in reading (Chomsky, 1972). This evidence for the need for a match between grammatical structure and reading seems to justify our hypothesis that a similar match must exist between pragmatics and reading. As Griffin observes, "accomplished readers acquire facts about the world from reading and on the other hand need to have facts about the world to be accomplished readers" (Griffin, 1974).

Whenever there is an interchange between disciplines, when the facts of one field are exchanged with the facts of another, there is an inevitable problem of terminology. Even an apparently clear word like context bears further scrutiny. Some reading manuals refer to context clues, but in general very little is done with them.

Context may be seen to be helpful to the reader on many levels at the same time. The information which is left unsaid in any given sentence is deeply dependent upon the context in which it must be implied. On a more obvious level, a sentence like "Father drove to the supermarket" leaves unsaid several obvious facts. For one thing, the setting is clearly mid-twentieth century, a fact signaled by the term, supermarket. Having determined this, the word drove signals the existence of a car (more quantitatively predictable than truck or bus) rather than a horse, donkey or goat. There is little in the semantic structure of supermarket which signals modernity. There is even less in drove which signals car. Yet most readers will clearly fill in such information as they process the sentence in question. To put all such information in the surface form of the sentence would yield something like "In the mid 'twentieth century at an unspecified particular time, Father drove a car (probably his own) to the supermarket (probably for the purpose of purchasing groceries for his family). Layers of other implications can be imagined. One must fill in that father had money as a result of being gainfully employed (although other less predictable alternatives also are possible) and that he intended to provide sustenance to his children (the word father implies children, including, quite likely, the person who uttered the sentence).

Context can be increasingly helpful to the reader as the passage becomes increasingly predictable. Since clichés are the most predictable, they provide the most predictable contexts for reading:

Sharp as a _____.
_____ as a cucumber.

Familiarity of object, concept or event is almost as predictable as clichés:

I eat lots of bread and j_____.
The batter hit the _____.

Since it seems clear that readers predict what they do not know on the basis of what they do know, it would seem appropriate to make use of predictable contexts, even clichés, in early reading situations. More important, it would seem appropriate to avoid unpredictable contexts, such as figures of

speech, metaphors or unknown concepts at such a stage in reading acquisition. Few reading programs ask the reader to call on context clues in any positive, constructive way. Most programs could benefit even from knowing how to avoid counter productive contexts.

One problem in developing context processing skills in readers is in getting the children to know where to look for critical information or clues. It is my opinion that an early stage would be to provide sentences with a blank with several potential fillers. The child must select one filler, then mark the word or words in the sentence which motivated that selection. For example:

The sailors were readying their _____ for winter storage.

and
planes
cars
boats
wet

In this case the reader would pick boats and circle sailors as the motivation. Naturally, it would be possible to believe that sailors might ready their cars or planes for winter storage, but this choice is less predictable than boats. The other two choices, and and wet, are excluded on grammatical grounds.

Similar language processing exercises might include the use of sentences with strategically placed blanks but with no particular focus on specific motivating clues. For example:

Jane's room is _____ because the _____ is open.
Giant _____ broke over the deck of the _____.

The skill involved in learning to process reading by context clues runs counter to a widely held but obviously erroneous assumption of reading--that the reader should read carefully. On the contrary, the skill to be developed is one of learning to ignore as much of the printed page as possible while still getting the general meaning. Ironically enough, most tests of reading comprehension run the risk of penalizing the efficient reader who has learned to make use of context clues to spot the important parts of the passage and to skim over the unimportant. For example, the following type of question requires the reader to pay careful attention to relatively unimportant details:

Read the sentence below. Put an X by any other following sentence that means the same thing as the first sentence.

A red fox family on a single hunt may catch eight pounds or more of mice and rabbits.

_____On a single hunt, a red fox family may catch eight pounds or more of rabbits and mice.

_____Eight pounds or more of mice and rabbits may catch a red fox family on a single hunt.

_____Eight or more red foxes on a hunt may catch a single family of mice or rabbits.

_____As many as eight pounds or more of mice and rabbits may be caught by a red fox family on a single hunt.

Such an exercise as the one above seems to contribute little to the efficient acquisition of meaning through reading. If anything, the task will develop cautious and suspicious readers. Rather, the task of processing involves confidence and a willingness to hypothesize from limited information. The real trick is in learning to seek out the right clues and to avoid the wrong ones. I have often wondered why we have not made better use of the knowledge and intuition of good readers in an effort to discover how they actually process such passages as the following:

> Can you remember when a friend wanted something you had? And you wished you had something that belonged to your friend? And then the two of you traded? Long ago, before there was any money everyone traded the things they didn't need for the things they wanted. Suppose you had two cows but no hay to feed them. You might find someone who would trade you some hay for one of your cows. Then both of you would have what you needed.
>
> But sometimes trading didn't work so well. Sometimes traders couldn't decide just how much hay one cow was worth. Even when they did agree, there were problems. They might decide the hay was worth only half a cow. But since half a cow is really no cow at all, the man would still have to give a whole cow for the hay. Trading was sometimes disappointing. And it was often hard work.

Recent experiments in walking a child through a reading test, administering it individually and orally have been very revealing. We have learned, for example, when asking a child why he answered what he did, that he sometimes answers wrong even though he knows the right answer or that he answers right but for the wrong reasons. One can only wonder what a test score can mean when the variation of right and wrong answers is so whimsical. By the same token, it is revealing to have children read passages like the preceding, then immediately say the three words which stand out most in their memories. Good readers will recall <u>trading</u>, <u>problem</u>, <u>cow</u> or perhaps other important words in the passage. By tracing the clues offered by good readers, we can learn something about the process involved in such search strategies. Eventually we can learn that a word which is often repeated is not always an efficient clue. In this sense, the word <u>problem</u> is probably a more efficient clue than <u>cow</u> or <u>hay</u>.

From such exercises we can learn that use of context, in the field of reading, *refers to the act of* determining the meaning of an unknown word by first noting the rest of the sentence, then guessing at the meaning of the unknown word which appears in it. The other words in the sentence and perhaps even the syntax help the child unlock its meaning. The sentence "There were seven yellow fleegles growing in the backyard," contains an unknown word, fleegles. An informal check on the reactions of twenty subjects showed that fleegles are thought to be flowers or bushes. The fact that seven of them can grow in a backyard implies something about size. That they are yellow tends to rule out the more commonly known trees.

In the case of the pragmatics of natural language, the term context takes on additional meanings. The basic meanings of the word, in such instances, are assumed to be known. "Can you pass the butter" contains no words which come close to the "fleegles" category in this regard. Linguists consider context to be more than just the surrounding syntax and phonology. It includes the social context, a reflection of the expectations of both the writer and the reader, the attitudes, beliefs and values inherent in both the purpose of the sender and the subjective reactions of the receiver.

The sense of situational appropriateness in such a wide range of contextual possibilities can be very complex. Recently, for example, I observed a pragmatic confusion in a Physician's office. The patient, obviously contemplative about the purpose of her physical examination, completely misunderstood the doctor's opening greeting:

Doctor: Hello, Mrs. J_____, how are you today?
Mrs. J: Well, I've been having a lot of pain in my side.

No words were uttered by either the patient or the doctor as the realization of both of their errors took place. Only awkward silence and body twisting ensued. In most social contexts, "How are you" has little or nothing to do with one's health. In a doctor's office, however, the territory becomes confused, at least for some patients.

Likewise, the status expectation of a reader or listener is critical to effective communication. Regardless of how much empathy a physician may develop for a working class patient, some evidence exists that it is inappropriate for the doctor to try to talk with his patient in the patient's own social dialect. Instances in which such behavior has been recorded seem to indicate that a patient's expectation is for the doctor to speak "doctor talk," not "patient talk." He is expected to be clear and he must develop receptive competence for his patient's language, but he runs the risk of inappropriate violation of expectation if he tries to speak it.

In the research on vernacular Black English done primarily in the sixties, it was established that there is a continuum which ranges from the sort of speech used in everyday life to the type which is found in more formal writing. Speakers of non-standard vernacular versions of English tend to be farther away from written language than are speakers of a more standard dialect. Thus, when it comes time for speakers of a non-standard English to learn to read, the

relationship of writing to speech sets up a greater predictability gap than it does for standard English speakers. As a result of this realization, several hypotheses were suggested (Wolfram, 1973) but few were ever thoroughly assessed. It was suggested for example, that a sentence such as "Jane asked if she could have some cake" might be grammatically unpredictable for a child whose home language specified the equivalent "Jane ask could she have some cake." The exact consequences of such unpredictability was never really charted, for the issue became clouded with non-linguistic considerations, mainly by the negative reactions of the general public to any written manifestations of non-standard language in an educational context. The principle of the mismatch, or potential mismatch of the spoken versus the written language continues to be operative, however, even in cases in which non-standard versus standard English is not an issue. At the onset of reading instruction, when the children are focusing most of their efforts on processing at the word level or below, such a mismatch may be less obtrusive. But once the child goes beyond the more mechanical aspects of reading and into more cognitive predicting at the sentence and discourse level, the similarities between the language used in real life and the language which one has to read may become increasingly unclear. The stuff about language which he knows and uses in his own speaking may be known and used by a writer in a quite different manner. Such a mismatch can prevent proper clue processing and hamper effective readings, especially for the reader who has mastered the smaller language unit processing skills adequately enough to have begun to call on them less and less while he moves to syntactic and discourse oriented processing.

Many of the potential mismatches which can occur in the processing of sentences by middle-level readers stem from the generally unrecognized differences which exist between speaking and writing repertoires. There are certain things that one writes but never speaks and others which one speaks but never writes. For example, we typically write "He will go" but say "He's going to go." But such differences between speech and writing are not limited to grammatical distinctions. Frequently we include irrelevant information in written language, especially unmemorable subordinate clauses which are inserted either to compact more information into the sentence or to represent an air of jaunty youthfulness:

> John, who wears bow ties and short pants, never plays football or tennis.

Such a sentence clearly violates Grice's cooperative principle. What is suggested is that a careful study be made of the ways in which early and middle level reading materials handle the various maxims which support the cooperative principle. Does irrelevance interfere with meaning? Is the passage ambiguous, obscure or disorderly?

Students who are learning to read already know quite a bit about language usage. We have known for quite some time that they know a great deal about grammar and phonology. To date we have been primarily concerned about the latter and we have tended to ignore the former, the pragmatics of language as it

relates to reading. Just exactly how does a reader apply his knowledge of language pragmatics to the reading process? What are the conflicts between the language pragmatics of the writer and those of the reader? How different are the facts of usage in writing from those of speaking? Are such gaps inherent? Are they exacerbated by particular materials? Does the focus on certain methods of teaching reading at certain times in the curriculum lead to more extensive gaps? Exactly which principles or maxims of language usage are typically violated in reading materials? What types of conflicts between the language pragmatics of reader and writer are tolerated? Which ones are critical?

These and many other questions have been revealed by the recent developments of pragmatics in linguistics. The implication for reading is obvious. What remains to be done is the work.

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THE DEVELOPMENT OF READING SKILLS WITHIN A BILINGUAL EDUCATION PROGRAM[1]

G. Richard Tucker

Educators in diverse countries, including Canada and the United States, are often faced with the necessity of teaching some of their pupils via a "weaker" language. This situation may arise, for example, in a country where some foreign language of wider communication (e.g., English, French, Spanish) or an indigenous national language (e.g., Hausa, Filipino, Swahili) has been adopted as the medium of instruction for all pupils; or in a country where immigrant children from diverse backgrounds enter a monolingual school system; or perhaps even in a setting where speakers of a nonstandard dialect (e.g., Black nonstandard English, Haitian Creole, Quebec Joual) attend a school where the teachers and the texts employ only a more prestigious standard form. In situations such as these, it would seem appropriate to consider the adoption of some form of bilingual instruction.

In addition, programs of bilingual instruction have been developed and used in many countries where a serious desire exists to develop in pupils competence in each of two official languages (e.g., English and French in parts of Canada; Afrikaans and English in parts of South Africa; Flemish and French in parts of Belgium).

Despite the existence of diverse approaches to bilingual education throughout the world, the number of programs which have been systematically and critically evaluated remains disappointingly small. In particular, longitudinal evaluations have been noticeably lacking (see, however, reports from Canada by Lambert & Tucker, 1972 and by Swain, in press; from Ireland, by Macnamara, 1966; from Mexico, by Modiano, 1968; from the Philippines, by Davis, 1967; and from the United States, by Cohen, 1974; and by Richardson, 1968).

In general, bilingual education programs seem to be designed to achieve one of two basic goals. Some seem clearly formulated to foster equal facility in both languages with a concomitant development of appreciation for the values and traditions of both ethnolinguistic groups while others utilize the development of early skills in the child's mother tongue as a "bridge" leading toward the more effective development of competence in some other target language. In programs of this latter type, study via the mother tongue is often abandoned after a transition has been made to the second language.

Persistent Questions. Whenever educators consider the adoption of some form of bilingual education, they must decide in what order they will sequence the introduction of instruction via the mother tongue and the second language;

and furthermore in what order they will sequence the introduction of reading in the two languages to achieve optimal results in their particular sociolinguistic setting. Engle (in press) has recently completed a critical review of twenty-five studies which bear in some way on this important topic. Unfortunately, it seems virtually impossible to draw any universally applicable generalizations from her survey.

In this paper, I propose to describe briefly four very different types of bilingual education programs; and then to report in some detail the results of a recently completed analysis of the development over eight years, of reading skills in English and in French within the context of a bilingual education program for English-speaking youngsters in Montreal.

Bilingual Education in Haiti

In the Republic of Haiti, standard European French comprises the medium of instruction within the government school system. The majority of the citizenry, however, speak--as their mother tongue--a dialectal variation popularly referred to as Haitian Creole which differs from the standard form in certain aspects of phonology, lexicon and syntax. All textbooks are written in the standard form, and supposedly all instruction occurs only in the standard. In fact, however, it is reported that teachers often informally and without authorization do use spoken Creole with their pupils--at least in the early grade levels (H. De Ronceray, personal communication). Unfortunately, fewer than 2% of all eligible Haitian pupils pass the sixth grade examinations and proceed to secondary education.

In October, 1974, the Centre Haitien d'Investigation en Sciences Sociales (CHISS) initiated an experimental program to assess the efficacy of a bilingual education program which will involve the initial use of Creole as a medium of instruction with a gradual bridge into standard French. In this program, pupils will first be taught to read in their vernacular by specially-trained teachers using newly-prepared vernacular-language materials. They will receive oral training in French as a second language with the gradual introduction of reading in standard French and an ultimate bridge into complete instruction via standard French during the middle primary years. The performance of experimentally instructed pupils will be systematically compared with that of several groups of control pupils whose instruction will consist of minor variations of the present curricular patterns.

The CHISS team has received funding to develop and to monitor this program over an initial four-year period with the possibility of later extensions. The rationale for this approach rests on the attractive but unproven assumption that children who are introduced to schooling in their mother tongue (in this case, a dialectal variation of the target language) and to the development of initial reading skills in their own vernacular will ultimately develop a greater proficiency in standard French and a higher level of content-subject mastery than Haitian pupils who begin their schooling in the target language. Let us turn now for a moment to a very different sociolinguistic setting.

Bilingual Education in the Philippines

For many years, English was the sole medium of instruction in all Philippine schools. In 1957, however, as a result, in part, of a study conducted in the province of Iliolo (see Ramos, Aguillar & Sibayan, 1967) a decision was made to use the prevailing local vernacular as the medium of instruction in grades one and two with a shift to English as the major medium in grade three. Following this approach, initial instruction and initial reading activities occur in the child's mother tongue. Oral English-as-a-Second Language (ESL) activities begin in grade one with English reading-readiness activities to commence in grade two. A follow-up experiment was conducted several years later in Rizal province (see Davis, 1967) to replicate and extend the finding of the original Iloilo experiment and to try to determine empirically the most appropriate time to introduce reading in English. The performance of five groups of pupils was examined. The groups varied according to the level of introduction of reading in English and of instruction in English (see Table 1).

Table 1

Design of the Rizal Experiment

Grade English instruction began	Grade English reading began	
	1	2
1	Group 1	
3	Group 2	Group 4
5	Group 3	Group 5

The general finding from this well-designed and well-executed study was that the time at which reading in English was introduced or the sequencing of vernacular and second language reading apparently made little difference in pupils' performance on an English language reading test. However, a "language effect" did emerge in that the children who had used English as their medium of instruction for the longest time had the highest scores on the language test at grade six. This trend continued and, in fact, became even more pronounced when the performance of the children was re-evaluated at the end of their secondary schooling (Revil, et al., 1968). In addition to these findings, it would also seem appropriate to note that the exclusive use of one language as the major medium of instruction results in transition difficulties for pupils at whatever level the change is made to the final non-native target language (see Tucker et al., 1970). Let us now turn to an example from somewhere closer to home.

Bilingual Education in the United States

In the United States, the passage and subsequent funding of the Bilingual Education Act (Title VII of the Elementary and Secondary Education Act) has provided the impetus and financial support for a large number of "model"

bilingual education programs. Unfortunately, very few of the Title VII projects have been critically evaluated. However, some general statements can be made about these programs. The major concern according to Cohen (1974, p. 95) has been for the "culturally-different and often economically-disadvantaged child." Typically, the approach has been to teach the early curriculum in the child's mother tongue (e.g., French, Navajo, Spanish), while attempting to develop English skills through a specially oriented ESL program, with the aim of bridging into English-medium instruction at higher grade levels. Although many researchers have suggested that reading in a second language should be introduced only after the child has become literate in his mother tongue (e.g., Anderson & Boyer, 1970; Saville & Troike, 1971), Cohen (1974, p. 97, quoting Perez) reports that "perhaps forty-five percent of ESEA Title VII bilingual education programs introduce reading in two languages simultaneously."

As far as I have been able to tell, the analyses to date of the various Title VII programs do not permit us to generalize with any degree of confidence about the optimal sequencing of mother tongue and second language for the development of literacy or for related instructional purposes. Let us turn now to a program with which I have been personally affiliated for many years.

Bilingual Education in Canada: The St. Lambert Experiment

Nine years ago, in September 1965, the South Shore Protestant Regional School Board began its first experimental French "immersion" classes for a group of English-speaking kindergarten children. This project, designed to promote functional bilingualism through a policy of home-school language switch, was initiated by the Board on an experimental basis in response to numerous requests from parents living in the community. The program which started out with two kindergarten classes in one school during 1965-66 has expanded throughout the South Shore system. During the school year 1974-75, this innovative program is being offered from kindergarten through grade 9. This year approximately 40% of all eligible kindergarten pupils have enrolled in an immersion program on the South Shore.

The kindergarten curriculum has been left largely to the discretion of the participating teachers. They stress the development of vocabulary and passive comprehension skills in French along with the other traditional kindergarten activities. They use a direct native language approach, in contrast to the second language methods typically used with English-speaking children. At the end of the kindergarten year, the children are assessed through direct observation by teachers and evaluators; but no attempt has ever been made to test them formally. By the end of the school year, most have built up an extensive recognition vocabulary and attempt to use single French vocabulary items as well as occasional short sentences. Productive skills vary considerably from one child to the next, but all are able to comprehend, without difficulty, simple children's stories as well as their teacher's directions.

At the grade 1 level, reading, writing and arithmetic are introduced exclusively via French. No attempt is made to teach the children to read in English, and parents are specifically urged not to do so in the home. In grade 2,

two daily half-hour periods of English Language Arts are introduced. The rest of the curriculum remains essentially the same, with reading, writing, arithmetic and elementary science being taught via French. The amount of instruction via English is increased gradually and by grade 7 slightly more than 50% of the curriculum is taught in English with the balance in French.

At the request of the Board authorities and the Minister of Education of the Province of Quebec we (see Lambert & Tucker, 1972) were asked to formally evaluate the program. The progress of the pupils in a Pilot Experimental class and in a Follow-up Experimental class has been compared each year with carefully selected Control Classes of French children instructed via French and English pupils taught via English. The Control Classes were selected from schools in comparable middle-class neighborhoods. In view of the well-documented influence of social class on language and intellectual development, and since the number of students involved was relatively small, considerable care was taken to equate very carefully the Experimental and Control Classes on intelligence and socioeconomic factors.

No attempt whatsoever was made to preselect or screen children for the Experimental Classes on the basis of IQ or other variables; thus both the Pilot and Follow-up Classes (in fact, all subsequent classes) contained children with a wide range of IQ and even had a few pupils with recognized perceptual-motor deficits.

We have now been following these two separate Experimental groups of children, the Pilot and Follow-up Classes, since they began their formal schooling. Thus far, after nine years, we are satisfied that this novel program of second language teaching has not resulted in any native language or subject matter (i.e., arithmetic or science) deficit. Nor does there appear to be any cognitive retardation attributable to participation in this program. In summary, the Experimental pupils appear to be able to read, write, speak, understand, and use English as well as youngsters instructed via English in the conventional manner. In addition and at no cost they can also read, write, speak and understand French in a way that English pupils who follow a traditional FSL program never do. These children have acquired a mastery of the basic elements of French phonology, morphology and syntax; and they have not developed the inhibition which so often characterizes the performance of the foreign or second language student.

The Development of Reading Skills within the St. Lambert Project

The Pilot and Follow-up Experimental classes have now entered grades 9 and 8 respectively, and we continue to monitor their progress. Last spring, I decided that it would be instructive to examine in some detail the development of English and French reading skills by one group of these pupils and to examine their performance on "reading" tests administered at the grade one, grade two, and grade seven levels.

Performance in Grade One. The Follow-up group comprised 38 children in grade one. As I mentioned, they had received all instruction (including the

development of reading skills) via French at the kindergarten and grade one levels. As mentioned, standardized tests of (among other things) English Language Arts and French Language Arts were administered to these pupils and to equivalent groups of English pupils attending English language schools and French pupils attending French language schools at the end of the academic year.

On the Test de Rendement en Francais, the Experimental group overall performed as well as the French control group ($F = 2.05$; 1,46 df, NS). This test was composed of three parts--word discrimination (10 items), sentence comprehension (10 items) and knowledge of appropriate word order (10 items). It is interesting to note that the Experimental children, as a group, performed very well on the first part ($\bar{x} = 8.38$); but relatively poorly on the second ($\bar{x} = 3.46$) and third ($\bar{x} = 3.24$) parts.

On the word discrimination subtest only three of the 60 distractors were chosen by three or more of the 38 children. Thus, marine was chosen by 9 pupils; while the correct narine was chosen by 24; douche was chosen by 5 while the correct bouche was chosen by 32; and poule was chosen by 3 while the correct boule was chosen by 28. The pupils, in general, seemed to have very little difficulty with word discrimination per se.

Although they performed relatively poorly on the word-order subtest where they had to indicate which of a string of words (e.g., sur Raoul rame le lac) would likely be the last word in the correctly ordered sentence, it is interesting that articles were selected for the last slot on only 2 of 494 possibilities; prepositions, 4 of 152; auxiliaries, 3 of 114; and possessive pronouns, 5 of 38. These data indicate that the pupils had developed a relatively accurate awareness of the usual positional restrictions--at least for these parts of speech.

The relatively poor performance by the group on the sentence comprehension subtest seems to be attributable to their still limited vocabulary (e.g., for the sentence "La mère de Roméo a pelé la patate mur," only 8 pupils chose Roméo à pelé la patate." For the sentence "Le cheval rapide tire la calèche de papa," only 5 pupils chose the correct answer "La calèche roule" while 19 chose "Le cheval tire la chaloupe.")

It should be remembered, however, that the Experimental pupils, as a group, did perform as well as the French-speaking control group.

The story was somewhat different on the various parts of the Metropolitan Achievement Test. On this test, the English control group performed significantly and consistently better than the Experimental group. This was not surprising, however, since the Experimental pupils had received no specific tuition whatsoever in English. Quite to the contrary, it was extremely surprising that the Experimental pupils scored between the 20th and 40th percentiles on the subtests of Word Knowledge, Word Discrimination and Reading.

An inspection of the Experimental pupils' performance on the various items of the MAT was not particularly revealing. For example, on Test 2--word discrimination--they responded correctly approximately 57% of the time versus 84% on the comparable French test. They appeared to have particular difficulty with the following discriminations (the correct choice is underlined) will-well; were-wore; shoe-show; must-most; down-done; there-three; dread-bread.

On the portion of test 3 which dealt with reading sentences, they performed correctly on 34% of the items versus 35% on the comparable French section. It seems likely that on this subtest they compensated somewhat for their relatively poor English word discrimination ability by using their native-speakers' intuition about English syntax. In fact, it seemed to testers at the time that the pupils were actually "learning to read" while they were taking the test.

In addition to examining the pupils' performance on the various subtests, I also computed several Pearson product-moment correlations. It is interesting that the correlation between the group's performance on the French and the English word discrimination tests was significant ($r = .48$, $N = 37$, $p = .003$). Likewise, the correlations between their performance on the French and the English sentence comprehension ($r = .41$, $N = 37$, $p = .012$) and total reading subtests ($r = .42$, $N = 37$, $p = .010$) were both significant. Furthermore, the correlations between a nonverbal measure of intelligence, Ravens Progressive Matrices, and the French total reading ($r = .12$, $N = 36$) and the English total reading ($r = .09$, $N = 37$) tests were both nonsignificant. These results suggest that there was variability in reading ability among the Experimental pupils; and that reading achievement in French (a SL, but the only language of instruction at this level) but not nonverbal IQ, was a good predictor of reading achievement in English--surely evidence for a positive transfer of skills across languages.

Performance in Grade Two. The Follow-up group consisted of 29 children in grade two.[2] During grade two, they received two 35-minute periods of English Language Arts instruction each day. At the beginning of grade two, the pupils were formally "taught" to read in English by a language specialist. At the end of the year, standardized English and French language tests were again administered to these pupils and to equivalent groups of control youngsters.

On the Test de Rendement en Francais, the Experimental group, on the average, performed as well as the French control group ($F = 1.72; 1, 30$ df, NS). The test at this level consisted of five parts: sentence completion (8 items), identification of words belonging to specified parts of speech (8 items), determination of grammatical gender (4 items), spelling (5 items), and identification of verb tense (5 items).

On the sentence-completion subtest, the pupils responded correctly 32% of the time; on the part-of-speech identification, 47%; on the gender determination, 49%; spelling, 42%; and on identification of verb tense, 39%. The patterning of errors was not particularly instructive; rather the point of interest was the comparable (and not particularly strong) performance by either the Experimental pupils or French native speakers.

On the Metropolitan Achievement Test, the Experimental pupils performed very differently than they had at the end of grade one. At grade two, they performed as well as the English Control group on the subtests of word knowledge ($F = 0.00; 1, 59$ df, NS), word discrimination ($F = 3.02; 1, 58$ df, NS) and reading ($F = 0.40; 1, 55$ df, NS) scoring respectively at the 85th, 80th and 75th percentiles. Thus, the relative deficit that they had displayed in English reading skill at the grade one level had completely disappeared by the end of grade two.

Once again, an inspection of the Experimental pupils' performance on the various items of the MAT was not particularly revealing. For example, they responded correctly over 77% of the time on the word knowledge subtest; and more than 93% of the time on the word discrimination subtest.

I again computed several Pearson product-moment correlations. Once again, there was a significant, positive correlation ($r = .60$, $N = 19$, $p = .007$) between the pupils' French total reading and English total reading. Furthermore, the correlations between their initial Raven's Progressive Matrices scores and their French total reading ($r = .33$, $N = 23$) as well as their English total reading ($r = .27$, $N = 26$) tests were both nonsignificant. There was also a positive and significant correlation between the pupils' performance on the French reading tests at grades one and two ($r = .49$, $N = 24$, $p = .015$) as well as a marginally significant correlation between their performance on the English reading tests at grades one and two ($r = .37$, $N = 27$, $p = .055$). The correlation between French reading at grade 1 and English reading at grade 2 was, however, not significant ($r = .30$, $N = 27$).

Performance in Grade Seven. The Follow-up group consisted of 22 children by the end of grade 7. The amount of English instruction had been gradually increased following grade 2 so that the program came to approximate a balanced program of bilingual education with the students studying English Language Arts, French Language Arts, some content subjects in English and some content subjects in French. At the end of grade 7 the Metropolitan Achievement Test, Advanced Form G, was administered to the pupils. In addition, they and a group of French-speaking youngsters were given a French reading test designed by our research group. This test consisted of having them answer a series of questions based on a story selected from La Presse--a Montreal French language newspaper. In addition, the pupils were asked to complete one French language application for a summer job and another for a credit card.

The Experimental pupils performed as well as the French youngsters on the job application ($F = 1.07$; 3,107 df; NS) and on the credit card application ($F = 1.48$; 3,107 df; NS) although they performed significantly less well than the French youngsters on the reading selection ($F = 7.28$; 3,116 df, $p = .0002$). We did not perform item analyses with these tests.

The Experimental pupils performed above grade level on all sections of the Metropolitan Achievement Test. We did not test an English control group at this level, nor did we perform an item analysis on the MAT.

Once again, I computed several Pearson product-moment correlations. At this level, there was a positive and marginally significant relationship between the group's performance on the English reading and French reading (La Presse) tests ($r = .42$, $N = 21$, $p = .059$). Furthermore, the correlations between their initial Raven's Progressive Matrices scores and their French reading ($r = .37$, $N = 21$) as well as their English reading ($r = .32$, $N = 21$) tests were again both nonsignificant. There were, however, positive correlations between their English reading at grade 1 and grade 7 ($r = .50$, $N = 22$, $p = .017$) and between their English reading at grade 2 and grade 7 ($r = .90$, $N = 18$, $p = .001$). The corresponding correlations for their grade 1, grade 2 and

grade 7 French reading tests were both nonsignificant ($r = .17$, $N = 13$; $r = .41$, $N = 19$). It must be remembered, of course, that the grade 7 French reading test was the only non-standardized instrument that we employed and there may be reason to question its reliability and validity. Lastly, there was a significant correlation between their French reading scores at grade 2 (but not at grade 1) and their English reading scores at grade 7 ($r = .634$, $N = 14$, $p = .015$).

Discussion

What generalizations, if any can we draw from the data which I have just presented? First, it seems clear that the bilingual education experience of this particular group of middle-class, English-speaking Montrealers has left no enduring symptoms of confusion or retardation in their native language. That is, for this group of youngsters and many others who have subsequently enrolled in similar programs in Montreal, we have found no evidence of any deficit which might conceivably be attributed to following a curriculum in which the second language is used as the initial medium of instruction and in which initial reading training occurs in this second language.

Wallace Lambert and I (1972) have hypothesized that these children who switch languages for schooling at the early grade levels get caught up in a process of comparing and contrasting two linguistic codes, one learned from infancy, and a new one that surrounds them from the very first day of school. We think the process may start as a type of translation game in which the youngsters construct personalized glossaries to link new sounds and expressions they hear with everyday things and events they have already labeled in their home language. But as they begin translating and realizing that "bonjour, mes enfants" probably is another way of saying "Good morning, boys and girls," they also learn that in other contexts "bon" and "jour" pull apart and take on the equivalent functions of "good" and "day." Then the comparison and contrast of codes starts to become more systematic as the children notice salient differences in word order "mains sales"(which differs from "dirty hands"), of gender ("le tableau noir" and "la porte," which differ from "the blackboard" and "the door"), and the like. The comparison process apparently is encouraged as much by similarities as it is by contrasts, for the children seem as delighted with other-code equivalents for terms they already knew (e.g., silence in French = silence in English) as they are with novel and unfamiliar contrasts (sensible in French/sensible in English). It is our impression that comparing languages is a very interesting process for the children, and that this children's version of contrastive linguistics helps them immeasurably to build vocabulary and to comprehend complex linguistic functions.

Another recurring process experienced by the children was, we believe, the early development of a linguistic "detective" capacity, that is, an attentive, patient, inductive concern with words, meanings, and linguistic regularities. Our inferences in this case were based on the children's better-than-expected scores on tests of French word discrimination, listening comprehension, and decoding. Their precocious skill in linking spoken French words with

appropriate written words (as measured in the word discrimination test), and their remarkable capacity to understand and react appropriately to French speech suggests that this process, like the preceding one, developed spontaneously and served as a source of interest and motivation.

A third process that we felt was operating is usually referred to as a "transfer" of skills from one language to the other. We refer here to the higher-order skills of reading and calculating, which were developed exclusively through the medium of French and yet seemed to be equally well and almost simultaneously developed in English. In fact, we wonder whether in these cases there actually was a transfer of any sort or whether some more abstract form of learning took place that was quite independent of the language of training. These developments took place so rapidly that we had little time to take notice of them. It seemed to us that all of a sudden the children could read in English and demonstrate their arithmetic achievement in that language. This process, which occurs rapidly and essentially without deliberation, certainly is amenable to further research.

How well do the data which I have reported reflect the data or observations collected by other researchers? Swain (in press), who has been associated with the evaluation of a number of French-English bilingual programs for English-speaking youngsters in Ontario, has concluded that a lack of exposure to formal English study until the grade 2 or 3 or even 4 level does not in any way adversely affect the capacity of students to master English skills when they are finally introduced. Cameron, Felder and Gray (1974), working in New Brunswick, have reported a spontaneous transfer of reading skills to the children's native language, English, as a result of immersion instruction in French. In the United States, Cohen (1974) reports a similar transfer for Anglo students enrolled in a Spanish-immersion program.

Furthermore, Swain has found in her analysis of a bilingual program in St. Thomas, Ontario, that English-speaking children who follow a program of total French immersion during kindergarten and grade 1 with English Language Arts introduced only at grade 2 perform as well as, and in some cases, better than a comparable group of youngsters who receive 50% of their instruction in French and 50% in English from kindergarten through grade 2. Swain speculates that it may be easier for an English child to learn to read in French because of the relatively systematic sound-symbol correspondence in that language. Furthermore, she argues that once the "game" of reading has been mastered, it is easier to transfer the skills back to one's native language whose sound patterns, vocabulary and syntactic patterns are well established than it would be to transfer them to a relatively unfamiliar "new" language.

Is it possible at this time to make a definitive statement concerning the optimal sequencing of languages and of initial reading instruction for bilingual education programs? I suggest that we cannot yet make any definitive statements based on the empirical data collected to date. However, Wallace Lambert and I (1972, p. 216) would suggest, on the basis of our experience a general guiding principle:

In any community where there is a serious widespread desire or need for a bilingual or multilingual citizenry, priority for early schooling should be

given to the language or languages least likely to be developed otherwise, that is, the languages most likely to be neglected. When applied to bilingual settings, this principle calls for the establishment of two elementary school streams, one conducted in language A and one in language B, with two groups of teachers who either are or who function as though they were monolinguals in one of the languages. If A is the more prestigious language, then native speakers of A would start their schooling in language B, and after functional bilingualism is attained, continue their schooling in both languages. Depending on the sociocultural setting, various options are open to the linguistic minority group: 1) prekindergarten or very early schooling, with half-day instruction in language B and half-day in A; 2) schooling in language B only until reading and writing skills are certified, then introducing instruction via A; or 3) a completely bilingual program based on two monolingually organized educational structures which allow children to move back and forth from one language of instruction to the other. Rather than teaching language A and B as languages, emphasis would be shifted from a linguistic focus to one where languages are thought of primarily as vehicles for developing competence in academic subject matters, including various forms of creative work.

In conclusion, let me state that we do not wish to lend support to those programs which view bilingual education as transitory bridges to monolingual English instruction; rather we are totally committed to the development of native-like proficiency in both languages with the concomitant development of a sensitivity to the values, attitudes and traditions of both ethnolinguistic groups.

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NOTES

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[2]Note that although the number of students participating in the Follow-up Experimental group drops from year to year, the classes at each grade level were still regulation size. The varying N reflects the fact that we have included in our yearly testing only those children who have participated in the program from its inception.